Construction Methods AND EQUIPMENT

DECEMBER, 1959

PRICE $1.00

A McGRAW-HILL PUBLICATION

With a combination of stationary and portable equipment, an Iowa contractor processes limestone for a highway project. The plant crushed 12,000 tons in 11½ hr, 1,146,000 tons in 5 months. **Page 84.**

CONTENTS, PAGE 4

Howard Stanton and son, James

"We've standardized 100% on Yellow Strand Flattened Strand!"

O. J. STANTON & CO., GREENWOOD, MISS.

WANTED: a modern wire rope to match the increased demands of heavier, faster, more powerful modern equipment.

Five months ago, O. J. Stanton & Co. found such a wire rope in Yellow Strand Flattened Strand. Today, their scrapers and dozers are 100% equipped with Yellow Strand Flattened Strand — in fact, they have used Yellow Strand Wire Rope for five years.

Stanton has found that Yellow Strand Flattened Strand outlasts round strand by a big margin — with considerable savings in total replacement time and rope costs — and a big boost to *going* time.

Your Yellow Strand Dealer — who is often the same man from whom you buy construction equipment — will gladly give you all the facts on Flattened Strand. Call him today!

Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

Yellow Strand®

WIRE ROPE

SLINGS

CLIPS

B.F.Goodrich

These B.F.Goodrich tires still going strong after 51,456 miles of rugged construction work

Wallace, Kinney and Lochridge Trucking Co. of San Mateo does construction work all over California. Here the job is hauling fill dirt for runway expansion at San Francisco International Airport. Trucks travel both on and off the road carrying loads as heavy as 27 tons.

In spite of these rugged working conditions, the B.F.Goodrich FLEX-RITE NYLON Rock Logger tires above have already given 51,456 miles of service, still have plenty of tread left. The company finds B.F.Goodrich tires can be retreaded 2 and sometimes 3 times!

One reason for this outstanding record is the thick Rock Logger tread that's specially compounded to resist rock cuts and bruises. Another reason is the B.F.Goodrich FLEX-RITE NYLON cord body which withstands double the impact of ordinary cord materials. It resists heat blowouts and flex breaks, too. No wonder B.F.Goodrich FLEX-RITE NYLON cords outwear even extra-thick treads, can be retreaded over and over!

Your B.F.Goodrich Smileage dealer has a money-saving tire for every construction job. See him today. He's listed under Tires in the Yellow Pages of your phone book. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

Smileage!

B.F.Goodrich *truck tires*

Construction Methods AND EQUIPMENT

DECEMBER, 1959

MEMBER

VOLUME 41 NUMBER 12

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WHYTE STRAND

brings out the best in your equipment!

Your construction equipment has been designed to do a certain job — efficiently and economically. It's our business to design and manufacture wire rope that matches the performance of those machines.

Because Macwhyte manufactures its own wire and fabricates only wire rope products, every bit of our engineering know-how and experience is concentrated on one objective: to give you the best rope possible for your equipment. As a result, Whyte Strand rope stands up longer, reduces downtime, boosts work output—brings out the very best in your equipment!

Here are special Whyte Strand ropes Macwhyte makes for you: shovel hoist rope, dragline, clamshell crane rope, boom hoist line, dozer rope, scraper rope, contractor's hoist and derrick rope, and winch line. Recommendations for all your equipment are shown in special brochure No. 5702, free for the asking.

MACWHYTE Wire Rope

MACWHYTE WIRE ROPE COMPANY

Kenosha, Wisconsin · Newark, Pittsburgh, Detroit, Chicago, St. Paul, New Orleans, Ft. Worth, Portland, Seattle, San Francisco, Los Angeles

ON THE COVER

Schildberg Construction Co., Greenfield, Iowa, set up this imposing plant to supply granular subbase and rolled stone base material to four other contractors building new Route 80 west of Des Moines. The four: Concrete Materials & Construction Co., Cedar Rapids; Booth & Olsen, Sioux City; Hallett Construction Co., Crosby Minn.; and Alexander Construction Co., Minneapolis. How the plant produced the material, mostly with Cedarapids equipment, is detailed in a story on page 84.

DEPARTMENTS

NEXT MONTH

A special report in the January issue will outline prospects for the construction industry during 1960. It will include a forecast of new business in each major type of construction and reports on price trends in major materials, on the labor outlook, and on new materials, methods, and equipment.

PHOTO CREDITS

P 105 (top) Bill Friend
P 156 (top) Bert Goldrath

DECEMBER, 1959

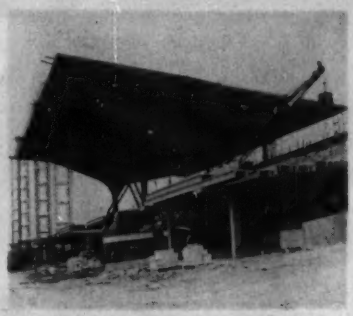
Pay Dirt in This Issue

Combination Machine Finishes Slab in One Pass 80

A new combination finisher-float handles all finishing in a single pass on a road paving job in Ohio. A central-mix plant supplies the concrete, and spreaders place it.

Race Track Builder Races Against Time 87

An Ohio contractor races the clock to erect a race track grandstand in time for the racing season. Inverted hyperbolic paraboloid roof shells are the biggest in the U. S.



Unique Machine Bores Missile Base Tunnels .. 99

Just developed, this tunneling machine features several unusual ideas. It represents a big improvement over hand tunneling methods for driving personnel tunnels at a Titan base.

Warner & Swasey Announces the ALL-NEW... ALL-HYDRAULIC Hopto® Line

MODEL 500

carrier or crawler mounted

This all new Model 500 HOPTO Hydraulic Excavator packs heavy duty capacity with a full 360° swing and a digging depth of 20 feet. Operation is fully hydraulic—there are no cables, drums, sheaves, chains or belts. A 100 gpm triple tandem pump and split control valves provide three individual hydraulic circuits. All three circuits can be operated simultaneously for full power and speed on all actions. Quick-change attachments include backhoe, shovel, clamshell, and ditch cleaning buckets. Buckets up to ¾ yard.

MODEL 200-TM

truck mounted

This mobile Model 200 Hopto rolls from job to job at highway speeds, digs 13'6" deep, and outworks many ½ yard excavators. Operation and control are fully hydraulic with the Hopto triple hydraulic system for full power on simultaneous multiple actions. Backhoe and shovel buckets are interchangeable.

MODEL 200-SPC

self-propelled crawler

Tough working conditions are made-to-order for this crawler mounted Model 200 SPC. Offers the same triple hydraulic system as the Duplex truck mounted model. Seat swivels to face either set of controls for fast operation. It digs 14' deep, has a 19' reach, 11' loading height.

MODEL 200-SPR

self-propelled carrier

Fast job-to-job mobility, easy one man operation, and a 16 foot turning radius are built-in advantages of the Model 200 SPR. Triple hydraulic system and dual controls mean fast cycling and high production. Backhoe or shovel buckets are interchangeable in minutes.

Distributors in over 75 principal cities in the United States and Canada

FEATURES COMMON TO ALL HOPTO MODELS

- **HEAVY-DUTY BOOM**—hollow-box construction of heavy formed steel plate
- **POSITIVE UNINTERRUPTED SWING**—from 180° to 360°, depending on the model
- **180° BUCKET WRIST ACTION**—opening full for straight and square sidewall excavations, closing full to insure heap loads in every pass
- **EASY TO USE CONTROLS**—eliminate operator fatigue, give smooth, positive control of every action

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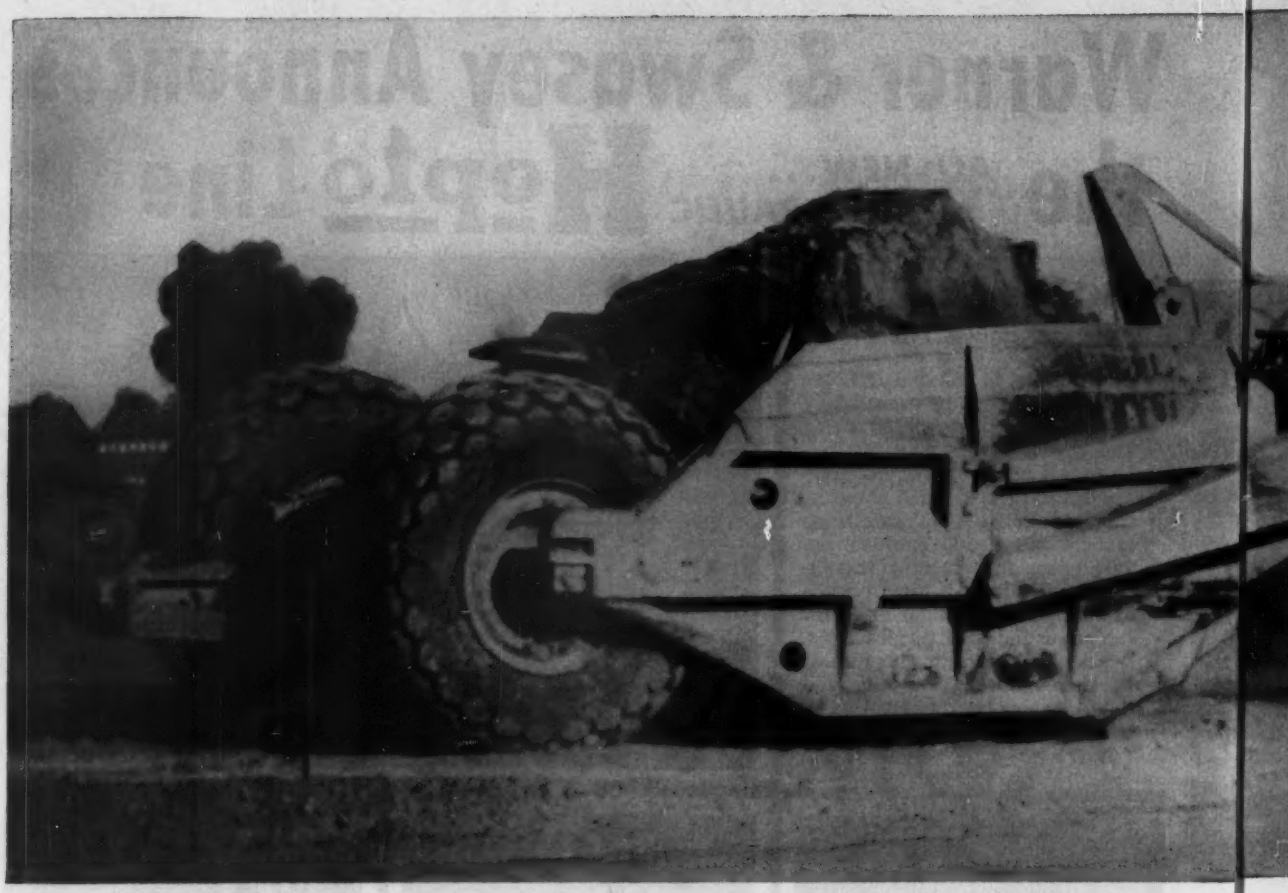


DESPITE 5,000 HOURS
"Texaco Simplified Lube Plan

says J. A. Fulkerson, land leveling contractor of Blythe, California

"This D-8 Caterpillar had run 5,700 hours when new rings were installed," Mr. Fulkerson continues. "When the engine was stripped at 11,130 hours in accordance with Texaco planned maintenance schedule, those rings were still amazingly clean, despite more than 5,000 hours' operation in a dustbowl.

"It's performance like this that has kept me a 100% Texaco customer for the past 15 years.

CLOSE INSPECTION by Mr. Fulkerson (right) and Texaco consignee G. E. Covington proves fine condition of rings and pistons of Caterpillar D-8 engine after 5,430 hours' service in conditions shown in top picture. Mr. Fulkerson has used Texaco 100% since 1944.

IN A DUSTBOWL
kept rings amazingly clean"

And the Texaco Simplified Lubrication Plan makes sure that all my equipment is getting the same kind of systematic servicing that kept this D-8 running so well."

Take a tip from Mr. Fulkerson. Try a Texaco Simplified Lube Plan on your next project. Every Texaco Plan is designed to handle all major lubricating requirements of a particular job with only six lubricants or less. Low inventory like that saves manhours in storage and handling, cuts paperwork in ordering, and minimizes the chance of misapplication of lubricants.

Ask a Texaco Lubrication Engineer to help you streamline your lubrication procedure with a Texaco Simplified Lubrication Plan. Just call the nearest of the more than 2,300 Texaco Distributing Plants, or write Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

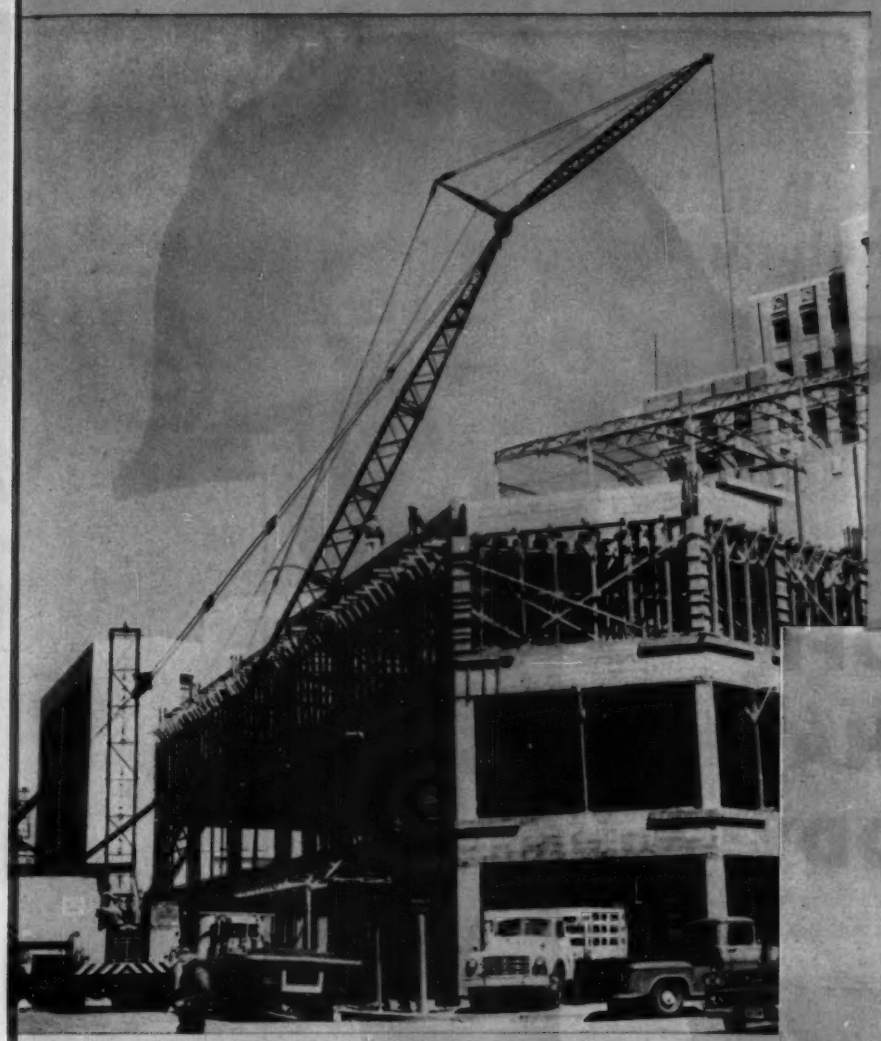
Tune In: Texaco Huntley-Brinkley Report, Mon.-Fri.-NBC-TV

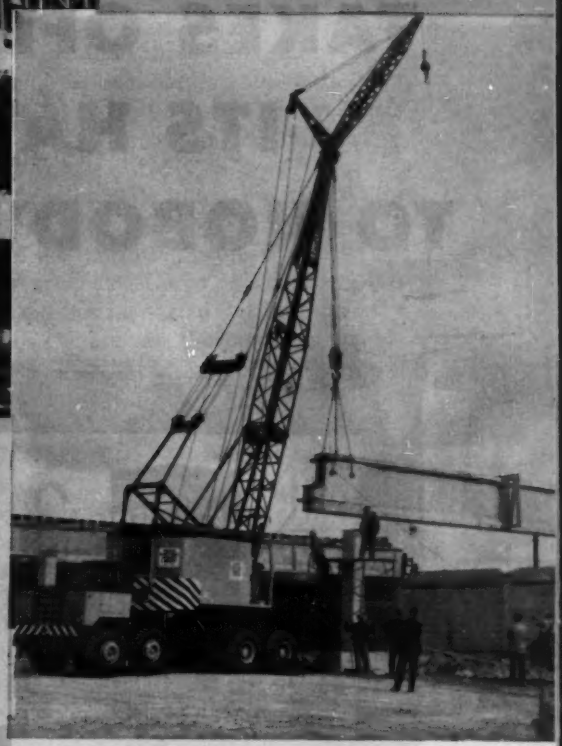
TEXACO

Throughout the United States
Canada • Latin America • West Africa

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

It's the lifts in the field— not the lifts on paper THAT PROVE A TRUCK CRANE!





No other piece of equipment must meet the wide range of problems that a Truck Crane is called upon to meet! See a Northwest at work. Compare its easy handling—its accuracy—its smooth control—its stability under load.

Here is a powerful, dependable tool with every crane advantage you need—on a carrier designed with full consideration for Truck Crane problems. It has plenty of reserve capacity and it's always ready to go for handling the tough, sometimes unexpected jobs.

Here is equipment that brings smoothness of performance in handling high lifts and long booms. The Feather-Touch Clutch Control gives the true "feel" of the load that assures the accuracy for setting high steel or the gentleness needed for spotting a highly stressed concrete beam. Uniform Pressure Swing Clutches give you smooth engagement, freedom from the grabs and jerks that set a boom to jumping. With a Northwest you put the load where you want it without jockeying.

The Northwest Standard Worm Boom Hoist and the Northwest High Speed Boom Hoist give you a combination that meets any booming problem. The Northwest High Speed Boom Hoist operates without sacrificing either main drum, independently of all other operations. Both boom hoists operate under power—both up and down.

Northwest Truck Cranes bring you every advantage you require for crane work. Sectional Boom Hoist Rigging and Pendant Lines, Telescopic Boom Struts, Folding Gantries, Adjustable Jibs, Removable Counterweight, 3rd Drums, Open Throat Booms and a host of advanced carrier features combine to get your job done quickly and profitably.

Don't buy a Truck Crane without getting the full story.

NORTHWEST ENGINEERING COMPANY
1503 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

TC-93-21-1C

CRANES
SHOVELS
DRAGLINES
PULLSHOVELS
TRUCK CRANES

3/4 to 3 Cu. Yd. Capacity

NORTHWEST

you to train new drivers?

$1,000? $1,500? $2,000? These are normal costs for training new operators —except for TORQMATIC DRIVE owners. They report saving up to $2,000 every time they break in a "rookie."

Reason? TORQMATIC takes guesswork out of shifting – ends shock-load damage and the need for engine-disconnect clutch repairs. TORQMATIC *automatically* adjusts engine output and speed to load or terrain changes.

TORQMATIC owners know that no operator can handle the "stick" and clutch as smoothly and efficiently—*every* time —as an Allison TORQMATIC. They bought TORQMATIC because they know, too, what it costs when rookies make a shifting and clutching mistake.

How can you eliminate these costs?

Look beyond first cost and see the total cost. Then change from clutch-pedal equipment to Allison TORQMATIC. You'll save costly engine-disconnect clutch replacements, too-frequent overhauls of overtaxed engines, repair bills for shock-load-damaged axles and drive lines.

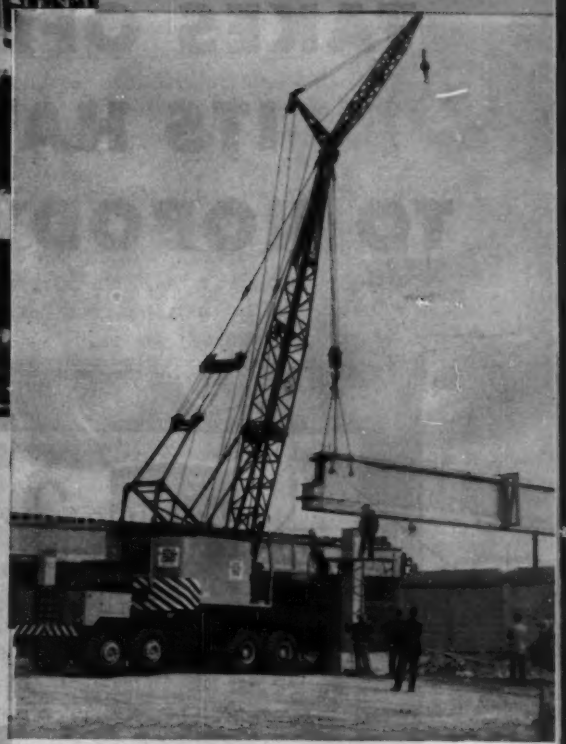
Why not get the full story today? See your equipment dealer or write Allison.

ALLISON DIVISION OF GENERAL MOTORS
Indianapolis 6, Indiana
In Canada: General Motors Diesel Ltd.,
London, Ontario

Allison TORQMATIC

TORQMATIC® DRIVES
THE MODERN DRIVE FOR MODERN EQUIPMENT

It's the lifts in the field— not the lifts on paper THAT PROVE A TRUCK CRANE!



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Don't buy a Truck Crane without getting the full story.

NORTHWEST ENGINEERING COMPANY

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CRANES
SHOVELS
DRAGLINES
PULLSHOVELS
TRUCK CRANES

3/4 to 3 Cu. Yd. Capacity

NORTHWEST

Construction News From Washington

Washington, D.C.
December, 1959

New Public Works Starts

One of the main budget-balancing policies of the Administration has just been tossed aside. That's the "No New Starts" rule that Pres. Eisenhower insisted on earlier this year.

Interior Secretary Fred Seaton, top boss of the Bureau of Reclamation, predicts that the budget the President will send to Congress in January will recommend appropriations to begin construction on some reclamation projects.

The Adminstration did all it could this year to prevent Congress from voting money for projects other than those on which work is already under way. But the Congressional Democrats—with help from some Republicans—voted money for 67 public works starts over a Presidential veto. They involve an estimated total cost of $800 million.

Now there's no doubt that Congress will vote—and the White House will approve—funds for new starts during the next session. Army Engineer flood control and dam building projects will be included along with reclamation starts. The Corps of Engineers has some 400 active projects authorized but unstarted, all high-priority jobs with good benefit-cost ratios. These are the cream of an $8-billion backlog of flood control and navigation projects.

Higher Bridge Clearances

A new regulation has been adopted by the Bureau of Public Roads at the insistence of the Defense Department. From now on, the minimum clearance for bridges on the 40,000-mile Interstate Highway System will be 17 ft. The minimum has been 14 ft.

Reason for the change is that the Armed Forces need to use the highways to haul missiles to launching sites around the country. The additional 3 ft will provide enough clearance for any missile in the works. The rule applies to all interstate mileage in rural areas and to at least one belt route in an urban area.

Cost of meeting this new requirement is estimated at an additional $1 billion. Some $330 million additional will go to the 10,000 bridges yet to be built; about $700 million will be needed to get this clearance on 6,000 bridges already in being on the designated routes.

New Federal Contract Provision

A subcontractor on a St. Louis construction project for the General Services Administration refused to tell the McClellan rackets committee about his dealings with an alleged labor racketeer.

continued on next page

As a result, a new provision has been inserted in all GSA contracts to make such a refusal to cooperate with a Congressional committee grounds for cancellation of a contract or for disqualification of a bid.

New Ruling on Expense Payments

Contractors and their employees are affected by a new ruling of the Internal Revenue Service regarding expense money for travel and other per diem payments.

The new ruling applies to expenses—for travel, lodging, meals, etc.—paid workers who are on a job in a remote area for a year or more.

The employer, beginning in January, must withhold income taxes on such payments, just as he does for salary payments. Copies of the ruling (59-371) appear in Revenue Bulletin 1959-47, which you can get from the Government Printing Office, Washington 25, D.C., for 20 cents.

A ruling for employees affected will be forthcoming soon, specifying how deductions, refunds, and the like must be handled under the new regulation.

The regulation applies if the worker has already worked for a year in a particular area; if at the time of hiring he is expected to be so employed for a year or more; or if it becomes apparent after hiring that he will be on the job for a year or more.

Monitors Plan to Oust Hoffa

Court-appointed monitors now hope to unseat Teamster President James R. Hoffa. Their power to cleanup the trucking union has recently been given Supreme Court backing.

Already a number of charges against Teamster officials have been prepared, including an accusation that Hoffa has misused $500,000 in Teamster funds. The monitors have an unofficial deadline for relieving Hoffa of his $50,000 a year post—within six months.

Switch in Federal Airport Aid

The $60 million the Federal government will spend this fiscal year for aid to airport construction is being spent a lot differently than in the past.

Allocations of Federal aid, which recipients match on a 50-50 basis, this year show that more money is going into construction of runways, taxiways, control tower and other projects that contribute directly to airport efficiency.

Building construction will take only 5.3% of the Federal money available. In some previous years, it has soaked up as much as 27%. Less Federal money will go for land acquisition; none of it will go to help pay for fancy terminal buildings.

ABOUT DAVE PARRO
33 yrs. old . . . Graduate of University of Illinois.
A stickler for details . . . worked in every phase of construction before own business.
Built volume from $50,000 to $1,500,000 in 4 years.
Surrounds himself with young men, open to new ideas, who can share his enthusiasm. Considers Jeff Combs a member of this group.

ABOUT JEFF COMBS
33-yr.-old Cities Service Lubrication Engineer.
Graduate of Purdue University.
7 years' experience in solving field lubrication problems. Loves the challenge of field work.
Believes personal service is biggest factor in gaining and keeping customers—has been known to drive several hundred miles to achieve this goal.

"Sometimes we feel we're in business with Cities Service,"

. . . says Parro Construction Corp., Urbana, Illinois

33-year-old Dave Parro, who built a $1½-million business from nothing in four years, attributes his rise to constant attention to details and praises Cities Service for the same.

"The fact is," remarks Parro, "our Cities Service Lubrication Engineer, Jeff Combs, gives us so much of his time and attention, I often feel we're in business together.

"Wherever we go, Jeff is there to assist with every detail of lubrication . . . and we follow his recommendations to the letter. For we've found that by doing so we achieve a degree of operating efficiency that is directly reflected in our competitive bidding. With attention to details like this, we not only win contracts, but achieve maximum profits with each job."

Mr. Parro touches on a vital point. Today, as bids become increasingly competitive, details like flawless lubrication can very well mean the difference between profit and loss on the job. Through superior products and on-the-spot field experts, Cities Service can help you stay on the profit side of the ledger. For details call the nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

"Our Fuels and Lubricants Carry A Big Work Load, but thanks to Jeff Combs' recommendations, there's never a failure. Trucks are serviced where they stand."

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

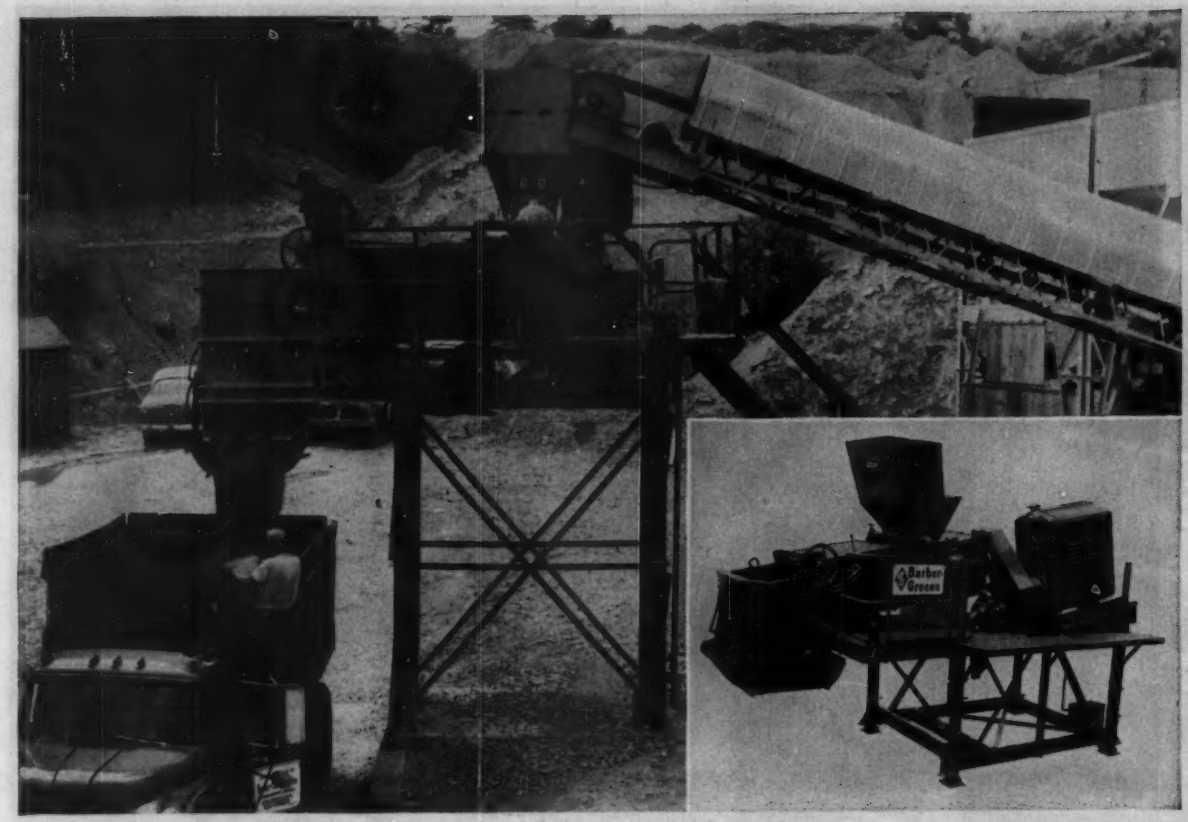
NO STAND-BY HERE!

Men, machines and materials aren't held up because INTERNATIONAL 230 Series Trucks are built to hold up!

WATCH 'EM WORK! Frame side rails on INTERNATIONAL 230 models are double channel and heat-treated — offer a combined section modulus of 24.74. Engineered with extra heavy-duty cross-members, they take the twisting torture of pot-holes and gullies under maximum payloads... and come back for more.

SEE 'EM DRIVE! Proven "six" and V-8 gas or in-line diesel engines produce full-muscled power with up to 695 lb-ft. of torque. Power-matched four, five or 10-speed transmissions with three or four-speed auxiliaries are all-weather conditioned to pull ahead over all ground and grade conditions.

LOOK 'EM OVER! They've got extra-rugged design from channel-iron bumper and diamondette steel fenders to husky reinforced rear cross-member. You get longer life with little maintenance in your choice of off-highway four- and six-wheel models that mean more work for less money!



One of the many high capacity Barber-Greene Model 828 Stabilization Plants now setting production records. Inset shows new Model 824.

New Barber-Greene Stabilization Plants provide record-setting capacity and economy

Cost-conscious contractors everywhere are meeting increased demands for base material with new high-capacity, low-cost Barber-Greene Stabilization Plants. These plants require less equipment and labor than "on-the-road" mixing methods . . . deliver greater accuracy in proportioning and water content . . . are less dependent on weather . . . consolidate material-handling.

Model 828 exceeds highest tonnage requirements of modern highway construction . . . new Model 824 offers ample capacity for applications where extremely high tonnages are not required, plus all the cost-cutting advantages of the Model 828.

Record production—many plants are producing over 600 tons per hour.

Twinshaft pugmill—assures fast, high-capacity mixing. Paddle tips are reversible, last longer.

Low maintenance—material forms its own mixing chamber . . . no liner plates to replace.

5-ton surge hopper—speeds truck loading . . . hydraulic clamshell discharge gate prevents segregation.

Adjustable dam gate—controls mixing time without changing capacity.

Easy erection—bolted structural support frames.

Wide variety of fines and aggregate feeding systems available. Diesel or electric power.

Ask for complete information 59-2-S

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Barber-Greene BG

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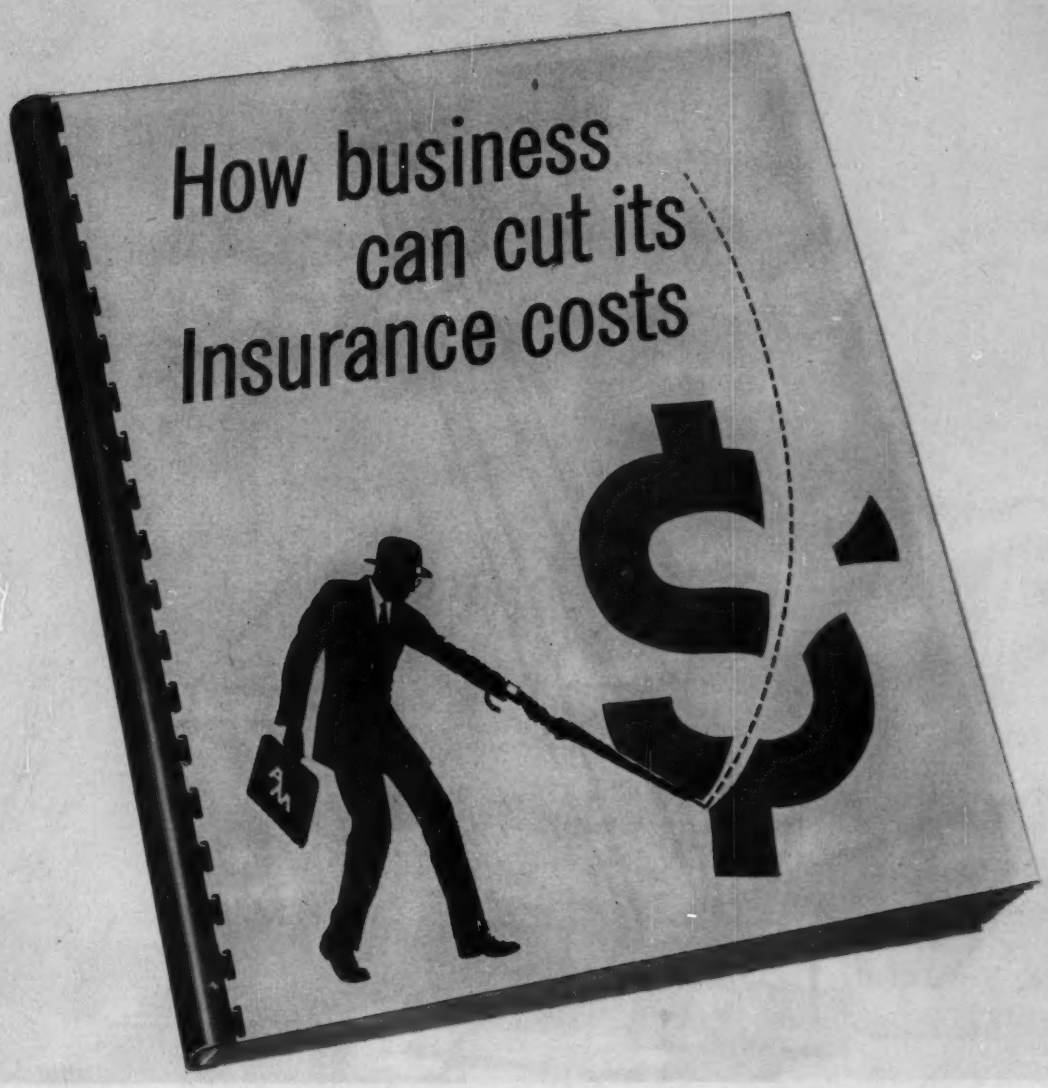
Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT



Now ready for insurance buyers!

Proceedings of a recent seminar at McGraw-Hill—now offered in book form by American Mutual!

To give cost-cutting insurance ideas to business and industrial editors for their readers, American Mutual specialists recently held a round-table session with McGraw-Hill publications.

These AM experts explained dozens of ways management can reduce costs and, at the same time, provide better insurance protection. For example, twelve tested ideas which could result in a total reduction in net cost of Group Insurance by 10% to 15%; one single step that could mean a savings of 75% on fire insurance.

All this information has been transcribed into a valuable, 108-page book that's an insurance buyer's "bible"—and it's yours for $1.00 per copy to cover printing and handling costs.

American Mutual

LIABILITY INSURANCE COMPANY

"The First American Liability Insurance Company" . . . a leading writer of Workmen's Compensation, all forms of Liability, Crime, Accident and Health Insurance.

For a copy of "How Business Can Cut Its Insurance Costs," write your name below and send with your company letterhead and check or money order to American Mutual, Dept. CM-1, Wakefield, Mass.

Suburban Excavators of Wakefield, Massachusetts use a 4-yard bucket on 100′ of boom in relocating streams on Interstate Highway project near Bernardston, Massachusetts. On a later project it handled well over 100,000 yards of peat in 22 working days. The Marion 111-M is available in bucket sizes from 1¾ to 5 yards, and with boom lengths from 80′ to 110′.

To help keep job profits up...

TODAY'S CONTRACTOR SELECTS TOMORROW'S MACHINE— THE MARION 111-M

Peak production on a day-after-day basis . . . peak production that can only come from a mobile, fast-cycle, low-maintenance excavator. This is what the modern contractor needs to offset increasing competition and resulting "tight" job bidding. That's why more and more contractors are turning to today's Marion 111-M, for it's a machine that delivers what its size promises. Here are some of the reasons why:

1. The MARION 111-M can be **easily and quickly converted** from one front end to another—on the job site.
2. The MARION 111-M utilizes **Ward-Leonard electric control** for swinging which, in company with the machine's inherently excellent balance, helps cut cycle time—increase production—reduce maintenance.
3. The MARION 111-M employs famous

Marionair control for all machine functions other than swinging — providing operators with instant, sure machine response at the touch of a lever, as well as low-maintenance service, and greatly reduced operator fatigue.

4. The MARION 111-M offers a machine size that **balances with modern haulage units** of higher capacity.
5. The MARION 111-M offers **big capacity** at maximum radius as a dragline or clamshell.

The Marion 111-M is a big capacity machine that has dramatically proved its ability throughout the world under the most difficult conditions. It incorporates field-proved performance features that produce big output at low cost. Get full details from your nearest Marion distributor or sales representative — now!

You get **MORE** *with* **MARION**

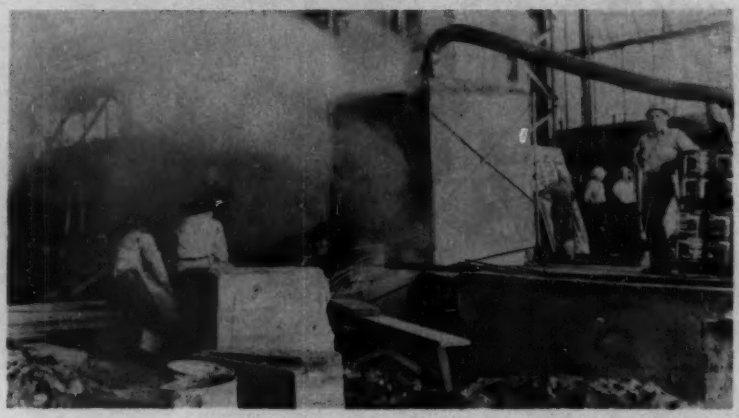
MARION POWER SHOVEL COMPANY,
MARION, OHIO
A Division of Universal Marion Corporation

The same Marion, equipped with a 4½-yard dipper, is shown ripping ledge during subfreezing weather on the new north-south Interstate Highway venture in Massachusetts.

P.S. To Bridge Builders . . .

MARION machines are piling up impressive work records on bridge work from coast to coast. Both the 21-ton 35-M crane and the 27-ton 43-M crane offer crawler-mounted performance benefits that stand out, either on the structure or down in the river bottom. Digging footers, driving piling, setting forms or steel and in pouring concrete, these machines give owners 13 BIG bridge-builder benefits. They are big work producers as standard machines—with optional equipment you can get every performance feature you've ever wanted. Let your MARION Distributor show you how.

Job Talk . . .



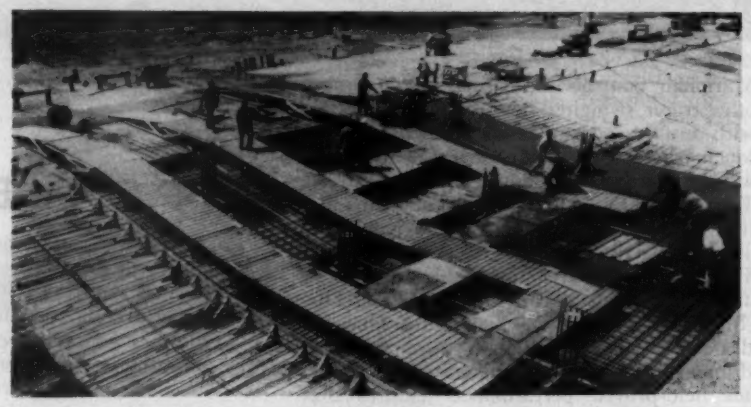
Powder Lance Cuts Concrete Slab

Covered by a hood that removes smoke, an Oxweld ACL-3 Powder Lance cut a 2-ft-thick concrete slab forming a launching way at Portsmouth (N. H.) Naval Shipyard into sections of manageable size for removal.

The new cutting tool sliced the 15x342-ft slab into 22 sections in just 100 hr. An overhead crane removed the 30-ton sections to clear the way for construction of an atomic submarine.

A special Oxweld mixture of 85% iron and 15% aluminum powder, burned in a stream of high purity oxygen, created an intensely hot reaction that melted through the 2-ft-thick concrete slab at a rate of 3 ft per hour. Lengths of ⅜-in. black iron pipe fitted into the lance handle carried the mixture of powder and oxygen to the cut. Pushed into the cut by the operator, the pipe burned off slowly, adding to the cutting action. In the same way the heavy reinforcing in the slab intensified the reaction.

The ACL-3 was developed by Linde Co., a division of Union Carbide Corp. They claim the tool can cut through any material, ferrous or non-ferrous.

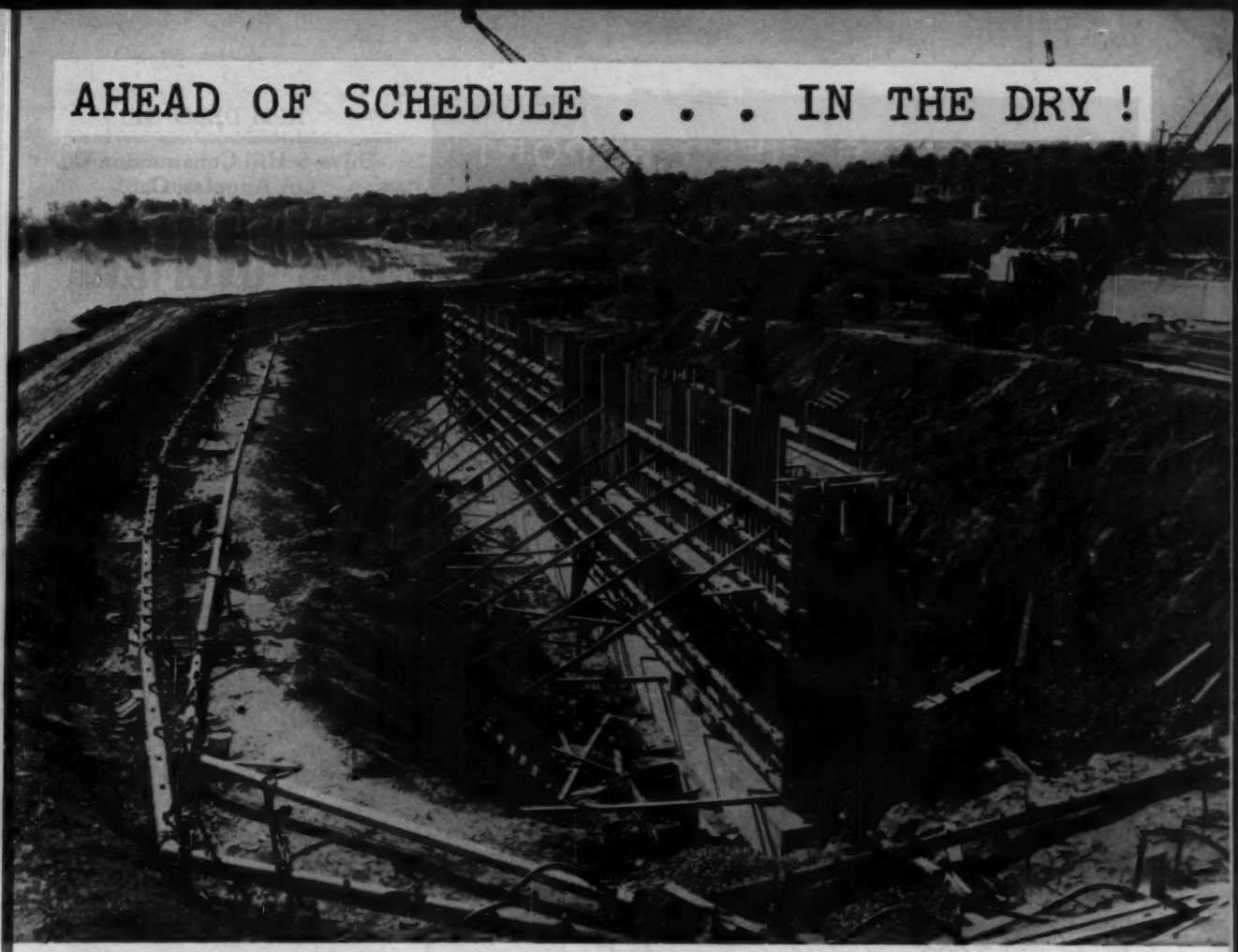


Concrete Buggies Roll on Light Runways

Steered easily by the workmen strolling behind them, self-propelled buggies speed concreting of a 342x510-ft base slab for a reservoir being built to contain filtered water in Detroit.

Contractor F. H. Martin Construction Co., Detroit, erects lightweight, easy-to-assemble runways to carry the buggies. Crews place each 5x6-ft runway section, made up of five 2x6 stringers covered by 1x6 slats spaced 1 in. apart, on two horses with 4x4-in. legs. Low labor costs for erection of the runways more

AHEAD OF SCHEDULE . . . IN THE DRY !



Pumping Contractors: American Dewatering Corporation, Rockaway, N. J. • Owners: N. J. State Highway Dept.

MORETRENCH WELLPOINTS lower water 22′ within an earth filled dike for pier foundations — Passaic River Bridge, Paterson — East Paterson, N. J.

Rough, hard digging — plenty of rain — high river stage — *nothing* has stopped Public Constructors, Inc., Blackwood, from making exceptional progress on this difficult job:

Pumping started September 21st.
By October 30th, contractor had poured concrete for Piers No. 3 and No. 4, and for piers and abutments for two approach roads.

Material consisted of stratified sand, gravel, and river mud with hard pan at subgrade.

Efficient predraining eliminated bracing . . . furnished a free, safe area in which to work at top speed — in the dry!

Every job has its problems. When WATER is the main one, call us. We can help.

MORETRENCH Corporation

389 Main Street
Hackensack, N. J.
HUbbard 9-7676
New York Tel.: CO 7-2283

4900 S. Austin Ave.
Chicago 38, Illinois
POrtsmouth 7-4212

7701 Interbay Blvd.
Tampa 9, Florida
TAmpa 61-1881

315 W. 25th St.
Houston 8, Texas
UNderwood 4-7774

Rockaway
New Jersey
OAkwood 7-2100

WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington
CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario
BRAZILIAN REPRESENTATIVE: Oscar Taves & Co., Ltd., Rio de Janeiro

ENGINEER'S FIELD REPORT

PRODUCT **RPM DELO OIL**

FIRM **Silva & Hill Construction Co. Los Angeles, Calif.**

5,000 hours at 2,000 rpm before overhaul

Working at 2,000 rpm speeds in heavy dust, Silva & Hill Construction Co. operates 8 Caterpillar DW-21s (like one above) five days a week removing 3,500,000 cu. yds. of dirt and rock for Burbank golf course. Firm reports RPM DELO OIL keeps these units rolling an average of 5,000 hours before major overhaul. Says Maint. Supt. H. C. Basinger: "We've got 39 diesel-powered machines working to beat a one-year deadline. Any unexpected delay costs plenty. That's why we stick with 'DELO'. It's proved it will keep equipment rolling longer without engine breakdowns or repairs."

Lubricated with RPM DELO OIL, this Caterpillar D-8 Tractor (left) turned in 10,000 hours, bulldozing and pulling sheepsfoot rollers, before major overhaul. Frank W. Hill (right) Silva & Hill partner, reports: "We've used RPM DELO OIL in all our diesel units since 1940. It has really paid off in keeping our equipment in top running condition."

LUBRICATING OILS RPM DELO

TRADEMARKS "RPM DELO" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming.

For More Information

or the name of your nearest distributor, write or call any of the companies below.

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado

JOB TALK . . .
continued

than makes up for the small capacity of the buggies—they hold only 1/3 yd. Larger units would require much heavier runways.

Transit-mix trucks chute concrete from street level to a hopper that feeds the buggies. They roll along the runways to the pour area and dump their loads over the side with pinpoint accuracy. A team of 10 buggies places as much as 65 yd of concrete an hour. The buggies easily take the maximum runway slope of 12%.

Low gas consumption of only 2¾-gal per 8-hr shift makes operation of the buggies economical. Manufactured by the Prime-Mover Co., Muscatine, Ia., the buggies are safe to operate. Because the operator is not a rider, he lets go in an emergency.

Scraper Carries An Extra Seat

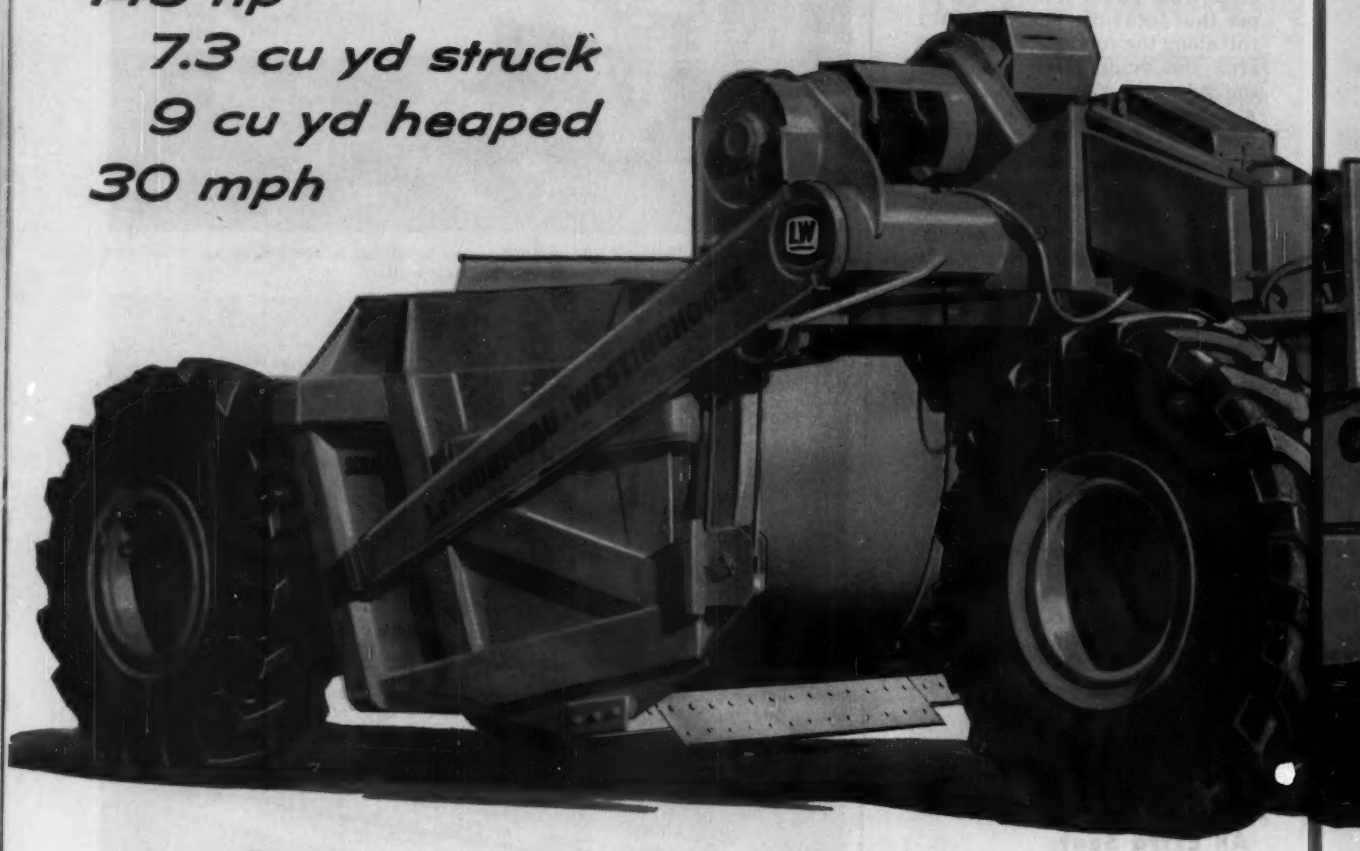
An auxiliary seat installed alongside the operator on a Caterpillar DW21 provides a safe perch for a trainee learning the ropes of scraper operation.

Boyd Callan, Inc., contractors on a section of the San Antonio Channel Improvement Project, collaborated with the Army Engineers in developing the idea. They installed a bucket seat similar to the original equipment and added a seat belt as further protection. Scraper controls are not duplicated for the extra seat; the trainee learns by observing the operator.

Before installation of the seat, the trainee rode a tool box to the left of the operator, hanging on to a curved bar in front. This was a violation of safety regulations on the job. The bucket seat, which can be added to any type of construction equipment, eliminated the hazard.

NOW *another D 'Pull® profit-builder*

143 hp
7.3 cu yd struck
9 cu yd heaped
30 mph



Here's WHY D 'Pull is a money-maker on any-sized job

D Tournapull ALONE in its size-range offers you:

PERMIT-FREE ROADABILITY: meets 8-foot width and weight limits, for quick, low-cost moves. Travels over city streets, curbs, *anywhere*, at up to 30 mph.

POWER-TRANSFER DIFFERENTIAL: automatically keeps greater power on drive wheel in best footing. Keeps production high on terrain that *stops* other units.

ELECTRIC CONTROLS: fastest-responding, simplest-operating, easiest-maintained control system built. Your operator works faster, more productively.

And D 'Pull LEADS its size-field these important ways:

BEST POWER-WEIGHT RATIO: each of its 143 "horses" has to power only 299 lb. Move payweight, not deadweight. Best on grades, fastest accelerating.

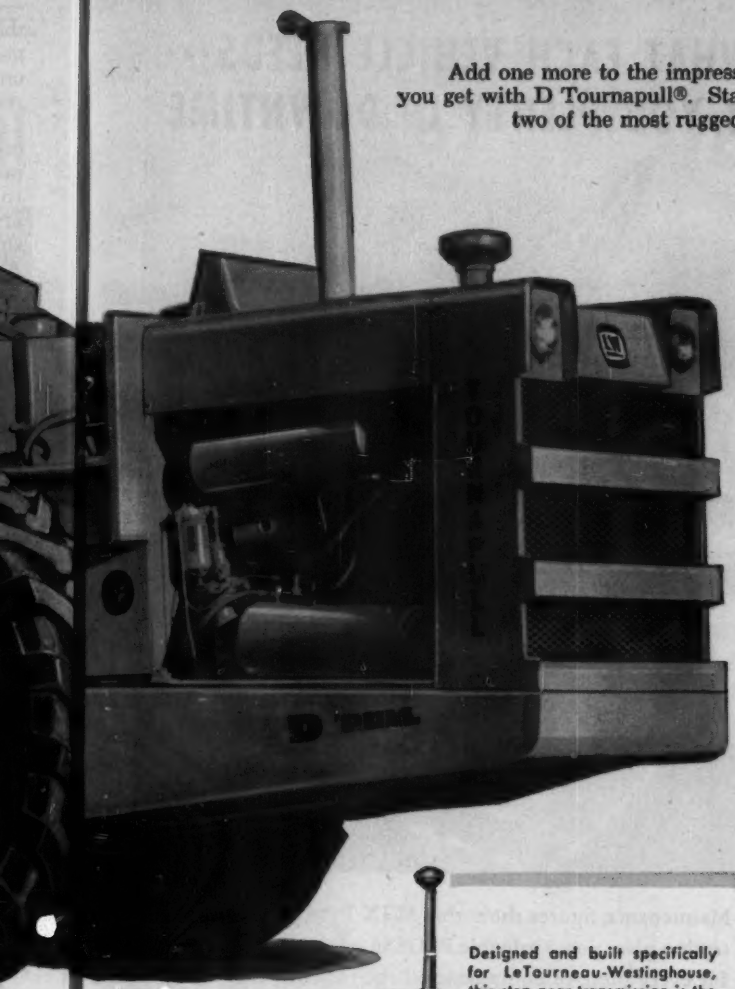
SHORTEST TURN-RADIUS: U-turns in only 24'3" for quick maneuverability in tight quarters. With flat bottom, "D" is an excellent *finisher*, too.

BIGGEST BRAKES: 2,800 square-inches of sure-stop surface, up to 4 times more than other scrapers. Your operator uses higher speeds more confidently.

Two "bonus" advantages: D Tournapull offers you the lowest list price of any well-known scraper in its class. And around the world, it brings its owners the highest trade-in value. Compare 'em!

...your choice of transmissions

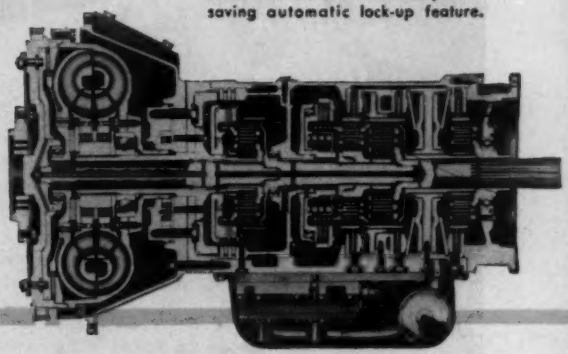
Add one more to the impressive list of production-boosting, cost-cutting advantages you get with D Tournapull®. Starting right now, you can order new "D's" with either of two of the most rugged and efficient transmissions ever developed. They are:



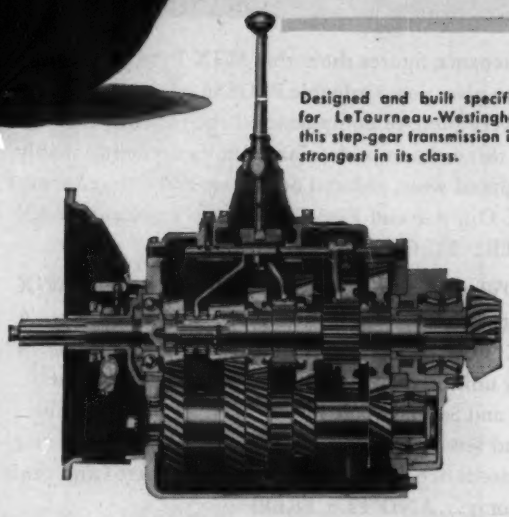
1 *Power-shift with torque converter:*

If you often work in loose or soft materials, and your machines are usually subject to rapidly changing loads, you will want your "D" equipped with the Allison Torqmatic CLT 3340 transmission, now available. It *automatically* adjusts speed and torque to your load, keeps your D 'Pull working at fastest practical speed. Cushions engine and drive-train from shock-loads for smoother operation, longer machine life. Infinite speeds through four ranges, to 30 mph; two reverse to 6.9.

Allison transmission includes power-saving automatic lock-up feature.



Designed and built specifically for LeTourneau-Westinghouse, this step-gear transmission is the *strongest* in its class.



2 *Step-gear "stick-shift":*

If most of your work is on jobs where haul-roads are well-maintained, and you work in generally normal footing, your D 'Pull equipped with the special Fuller 5G-720 step-gear transmission will give you extra operating economy. You get automatic filter action, full-pressure lubrication, and clutch-saving inertia brake. Gear teeth are crown-shaved, and the case is super-heavy. Five forward speeds to 26.1 mph, reverse 2.8.

Get this free "D" booklet now:

Ask your LW Distributor (or write the factory) for this brand-new booklet explaining all about the D Tournapull. It shows you how to *make more money on any-size job* with this rugged "go anywhere" machine. It also explains every major mechanical component of the "D", including the two new transmissions. You'll want it for your equipment-data files.

*Trademark DP-2252-DC-2

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

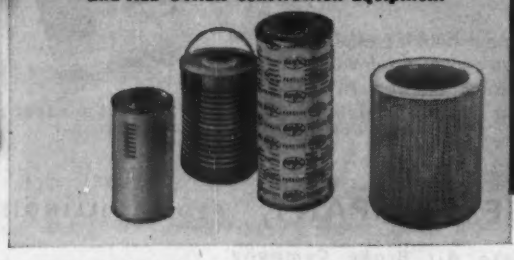
Where quality is a habit

KNOW WHAT EACH VEHICLE NEEDS···
WRONG GUESSES CAN COST YOU PLENTY IN DOWNTIME

WIX OIL FILTER SURVEY
designates service needs of every filter on each vehicle... provides inventory control record... survey conducted by WIX factory trained specialist at no cost to you.

There's a WIX Cartridge engineered for every engine in construction service including:

CATERPILLAR • INTERNATIONAL • LE TOURNEAU
ALLIS CHALMERS • DETROIT DIESEL • MURPHY
and ALL OTHER Construction Equipment



Maintenance figures show that WIX Prescription Filtration gives you a valuable PLUS in engine protection for every piece of equipment on the job. In fleet after fleet, this extra in performance shows up unmistakably in reduced wear, reduced downtime and reduced costs. WIX Oil, Air and Fuel Filters keep engines CLEAN WHERE IT COUNTS... INSIDE!

KNOW your engines and KNOW their needs. WIX factory trained experts will help you at no cost. A WIX Filter Survey spots the filter requirements of every unit in your spread... Oil Filters... Air Filters... First and Second Stage Fuel Filters... Hydraulic Filters ...and sets up a sound schedule for you. Here's better maintenance, fingertip inventory control and real economy... AND IT'S FREE!

wix® FILTERS

Write and get the facts on a WIX FREE Filter Survey and how you can have full filter inventory protection! Write today!

WIX CORPORATION • GASTONIA, N.C.
In Canada: Wix Corporation Ltd., Toronto
In New Zealand: Wix Corporation New Zealand Ltd., Auckland

Has no springs, rides on Hydrair*

— With Haulpak's exclusive air-hydraulic suspension system, you completely eliminate maintenance and repair of springs. 4 Hydrair units cushion against loading and travel shocks . . . keep unit riding level over bumps and holes. LW Haulpak also has exclusive LW power-transfer differential — permits unit to haul over wet, muddy areas that bog down competitive trucks.

You'll haul more tons per hour at lower cost . . . with

LW Haulpak®

Low loading height — (only 10'1" on 32-ton size) and large top opening (14'5" x 11') makes it easy to load LW Haulpak *fast*, without spillage.

This revolutionary off-highway truck gives you highest output at lowest ownership and operating costs. You get these profit-making benefits because the all-new, fully-proven LeTourneau-Westinghouse Haulpak is built *specifically* for rugged, heavy-duty hauling. It is not a "beefed-up" highway truck . . . nor does Haulpak have the maintenance problems common on ordinary haulers.

Notice, for example, Haulpak's rugged "V"-shaped body. This exclusive LW design gives you *bonus* yardage within a short wheelbase . . . makes for easy loading . . . and provides a low center of gravity for exceptional stability.

LW Haulpak's short, 130-inch wheelbase gives you unusual maneuverability (makes non-stop U-turn in area only 44'6" wide . . . shortest turning radius of any big off-road truck). You spot, swing around, back up and dump *fast* . . . you eliminate most maneuvering delays, complete faster cycles. You have "feather-touch" power-steer, too . . . system is located high behind bumper, well protected from damage.

And, very important, time lost for maintaining your Haulpak is practically nil. It needs *no* daily lubrication. The entire Haulpak lubrication check — *needed only at 500-hr intervals* — consists of just 4 easily-reached grease fittings. In addition, LW Haulpak's various parts and assemblies — some of them tested and proved by *millions of hours* on LW Tournapulls® all over the world — are much stronger than those used on competitive haulers.

22, 27, 32-ton sizes

Ask us for detailed specifications on the size Haulpak that fits your needs. Available in 22, 27, and 32-ton sizes . . . 290, 335, and 375 hp. Compare its features with any other truck in the industry . . . you be the judge!

*Trademark HP-2155-G-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

80% of all soil stabilization is done with SEAMAN-ANDWALL STĀ-BILT MIXERS

The **STĀ-BILT** Self-Propelled Mixer equipped with pump, tachometer, volumetric meter and spray bar.

The **STĀ-BILT** Pull-Type Mixer

The **STĀ-BILT** Self-Propelled Mixer

80% of all units used in stabilization are STĀ-BILTS. That fact is shown in an impartial market survey. There are plenty of good reasons — "plant mix quality at road-mix cost;" absolute control of aggregate segregation; high daily production of mixed and blended materials (up to a mile a day of 22 foot road) — all at low operating cost.

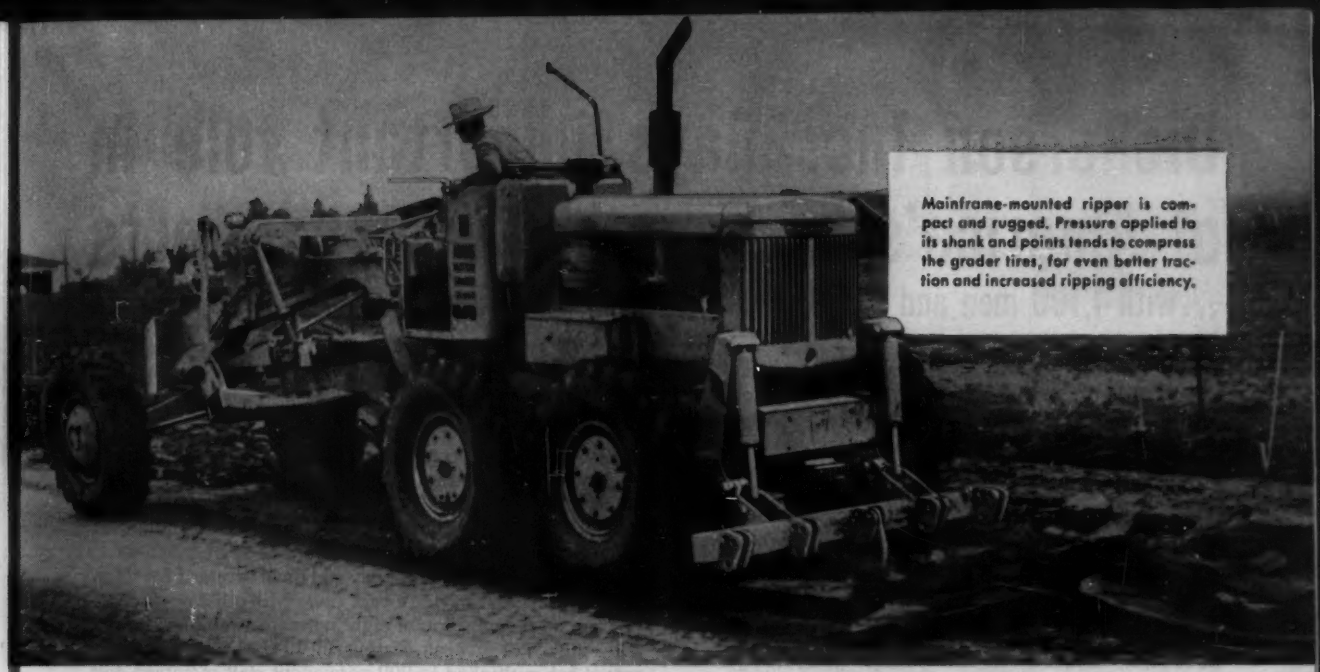
What's more, the STĀ-BILT MIXER handles any binder and any material — and it leaves the mix shaped to crown and grade, partially pre-compacted ready for final rolling.

Call us for further information — or a demonstration.

SEAMAN-ANDWALL

A subsidiary of American-Marietta Company

Elm Grove 4, Wisconsin



Mainframe-mounted ripper is compact and rugged. Pressure applied to its shank and points tends to compress the grader tires, for even better traction and increased ripping efficiency.

NOW AVAILABLE...Rear Rippers for LW Graders

Available now, for use with LW 550 or 660 motor graders, is this new heavy-duty ATECO *ripper*. Attached to the rear of a big LeTourneau-Westinghouse grader, it breaks up heavy and tough materials, *at fast speed*... gives new versatility to motor graders.

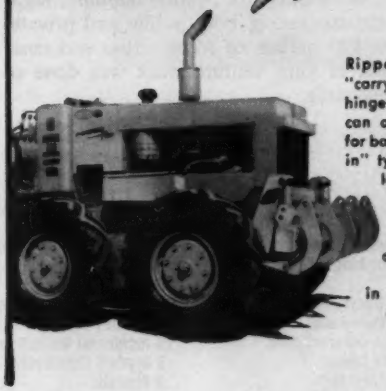
Easily and quickly mounted to LW's massive, one-piece frame, the ripper operates through the grader's hydraulic system. Its shank shape and point angle... teamed with the power and weight of the "550" or "660"... provides quick penetration, to any depth up to 12 inches. The ripper greatly increases the usefulness of your LW grader, and makes it a one-man "wrecking" tool that will let you handle more work at a saving in time and equipment.

Fully-tested, fully-approved

This new attachment was engineered especially for the LW 550 and 660 by ATECO, a pioneer designer and developer of ripper attachments. The unit has been made available only after months of testing and successful application on LW graders, where it proved its money-making potential.

This new money-saving attachment is available with several different shank shapes, for various jobs, and can be mounted to "660" or "550" graders in the field, or purchased as optional equipment with new graders. Ask for full details.

Operator has complete and accurate control, can "scalp" asphalt pavement faster than with any other tool. With rear-mounted ripper for high-speed work in tough materials, and front-mounted scarifier for work around manholes and other obstructions, LW 550 and 660 graders add to their usefulness.



Ripper is shown in raised "carry" position, using one hinge pin. Unit's raised shanks can also be pinned rigidly, for bank, corner, or any "back-in" type work. Ripping is a logical utilization of the excellent power and traction characteristics of the big LW 550 and 660 graders, which offer 123 and 145 hp in "straight-shift" models, and 160 and 190 hp in POWER-Flow® torque-converter models.

G-2244-G-1

LW **LeTOURNEAU-WESTINGHOUSE COMPANY,** PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Dickerson Inc. plays important role in of America's bridges, highways, airports

...with 1,100 men and 1,000 units of construction machinery

THE vast contributions of the construction business to the nation's growth and progress are unmatched by any other industry. The large amounts of machinery, materials and manpower employed by contractors make construction one of the nation's largest industries.

One of the leading contractors in the Southeastern states is Dickerson Inc. of Monroe, North Carolina. And the man behind the rapid growth and success of this firm is N. K. Dickerson, Jr., its founder and president. This dynamic, forward-thinking contractor got an early start in construction as Southeastern Manager for R. B. Tyler Company in the construction of highways, airports and related projects. In 1942, he formed N. K. Dickerson Jr. and Co. in partnership with his wife Sara with a very nominal investment. The partnership purchased several trucks and began renting them to various contractors.

As the partnership prospered additional machinery was purchased and several more partners were added. By 1944, the partnership owned 26 trucks, two automobiles, a welder, a crane, dragline and other smaller units. In its first year of operation the firm did dragline excavation and truck work, and gradually got into bituminous treatment and plant-mix paving. In 1945, with a total capitalization of $168,500, Dickerson Company was formed with eight general partners. The company began competitive bidding against older established highway contractors and expanded to grading, drainage and building construction. On April 1, 1947 the firm was incorporated.

From $5 million in 1947 to $15 million in 1959

At the end of its first year of incorporation, Dickerson Inc. completed $5 million of construction. Since 1947, efficient use of manpower, machinery and materials enabled Dickerson to expand operations to Maryland, Delaware, Virginia, Tennesee, Kentucky, South Carolina, Georgia, Alabama and Florida. Dickerson is departmentalized, with estimating, building and non-building departments functioning as separate units. The many types of construction which Dickerson now contracts for include building, highway, airport, bridge, excavation, both public and private. In 1959, a total of $15 million of construction was completed. Nine million of joint venture work was done of which 50% was Dickerson's.

Tackles difficult jobs — grows rapidly

Since 1947, this contractor has received 1,625 actual contracts; 489 building and 1,136 highway, bridge, paving and other-than-building contracts. Mr. Dickerson attributes this large number of contract awards to the firm's willingness and ability to tackle the difficult and unusual jobs. As a result, since 1947, the firm has completed some $100 million of work. They can produce 1 million tons of aggregate a year, excavate 45,000 cu. yds. per day and do in excess of 8 million yds. of bituminous paving a year along with other operations.

From an organization of eight permanent employees and 200 employees at peak seasons in 1947, Dickerson's personnel has multiplied to 200 permanent staff members and up to 1100 workers.

Key men form outstanding success team

The man most responsible for the organization's exceptional rise in a little over a decade is N. K. Dickerson, Jr. president. Under him is a hard core of key men who combine their talents in the direction and management of construction operations. Mr. Dickerson credits the firm's growth and success to these men: H. C. Shirley, R. W. Parks, v.p.'s; A. D. Nanney, Secty and Treas., H. B. Mangum, Asst Sec. & Treas., C. B. Durham, W. L. Howerton, W. C. Crowell, B. D. Smith, R. W. Parks, Jr., J. E. Shirley, D. J. Gordon, vp's and R. J. Morrison, engineer-pilot . . . plus the many other loyal key men who have served the firm for many years.

1,000 units of equipment carve out construction

One of the keys to Dickerson's rapid growth is the strong emphasis placed on owning and operating the latest and most efficient equipment. Dickerson has one of the most complete and modern construction units in the South. From 150 units in 1947, the firm's equipment inventory is now over 1,000 pieces. From $500,000 to $700,000 a year is spent for new machinery. Older units and inefficient items are promptly traded or sold. A piece of equipment must pay its way with the corporation to remain in its possession. Dickerson's large inventory valued at $2.5 million is shown below:

DICKERSON EQUIPMENT

12 compressors — (Ingersoll-Rand, Jaeger, Gardner-Denver, Worthington, Chicago Pneumatic)
27 cranes — (Koehring, Bucyrus-Erie)
4 wagon drills — (Ingersoll-Rand)
19 wheel type tractors — (International, Allis-Chalmers, John Deere)
31 motor graders — (Caterpillar)
33 tractors, crawler — (Caterpillar, Allis-Chalmers, Euclid)
1 gravel plant — (Cedarapids)
20 self-propelled scrapers — (Euclid)
6 pull type scrapers — (Caterpillar)
5 stone spreaders — (Jersey)
3 rock rippers — (Caterpillar, LeTourneau-Westinghouse)
35 pickups — (Ford)
90 dump trucks — (White, Mack, Reo, Ford)
8 low boy trailers — (Rogers, Martin)
20 incidental trailers (parts, office, tankers)
8 asphalt distributors — (Etnyre)
3 Gradalls
4 generators — (Caterpillar)
23 rollers — (Buffalo-Springfield, Huber-Warco, Galion)
21 rollers, rubber tired — (Bros, Grace, Tampo)
6 asphalt heaters and boosters — (Cleaver-Brooks)
11 conveyors — (Fairfield, Barber-Greene)
18 welders — (Hobart)
5 asphalt plants — (Pioneer, Cedarapids)
12 asphalt finishing machines — (Barber-Greene, Cedarapids)
10 radio base stations — (Motorola)
45 two-way radios — (Motorola)
10 concrete mixers — (Koehring, CMC)
3 rear dump trucks — (Euclid)
8 pile drive hammers — (Vulcan)
4 drum hoists — (CH&E)
8 ready-mix trucks and batching equipment — (Ford, Mack, International)
1 Beechcraft twin engine airplane
1 Cessna 180 airplane

building $15 million and buildings

$800,000 a year for maintenance

Dickerson spends $800,000 each year in keeping machinery and trucks in top condition. Each piece of equipment has at least one complete shop examination and overhaul each year during the slack season. Completely new motors, parts, etc. are installed where needed to give the firm the most efficient equipment during operations. Thirty five men engage in this operation full-time, and facilities are being expanded.

Employs 2-way radio and airplanes

Dickerson Inc. is a modern contractor who employs every means available to speed up and streamline his operations. Forty five two-way radios are located at asphalt plants, paving and earthmoving operations, and in automobiles used by superintendents. Ten base stations provide the necessary range for coordinating widely scattered operations over different states. Two airplanes are used exclusively for Dickerson's contracting operations. Two full-time pilots are employed enabling top management and supervisors to fly from project to project. They fly maintenance parts where needed and get management to trouble spots in the shortest possible time. The planes are also used to inspect and bid work.

Spends millions a year for materials

Contractors like Dickerson who perform a wide variety of construction in many scattered locations invest considerable money for materials. In a year's operation, Dickerson averages $1 million for asphalt, $1.8 million for aggregates, $800,000 for steel, $470,000 for gas, fuel and lubricants.

"Purchasing requires teamwork", says N. K. Dickerson, Jr., President

"There are many key men in an organization of our size who have an influence, directly or indirectly, on equipment purchases. Our superintendents, job foremen, equipment superintendent and men in top management make up the team that gets into the act. We often hold meetings to consider recommendations, thrash out the pros and cons of different equipment and brands... and our final decision is the result of a joint team effort."

CONSTRUCTION METHODS magazine reaches key men

Dickerson Inc. is one of America's leading contractors, as evidenced by the facts presented. Seventeen of this contractor's key men, from the president down, are paid subscribers to CONSTRUCTION METHODS AND EQUIPMENT magazine. Its value to contractors engaged in all types of construction is reflected by the more than 48,000 men in construction who pay for it. Advertisers too, recognize the value of this publication in reaching important contracting firms like Dickerson Inc. (and its key personnel) across the nation.

Construction Methods AND EQUIPMENT

A McGRAW-HILL PUBLICATION

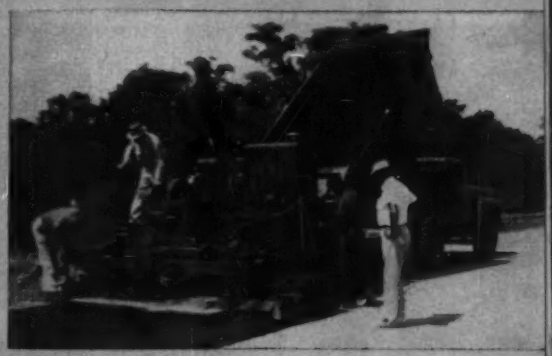
330 WEST 42nd ST., NEW YORK 36, N.Y.

N. K. DICKERSON Jr.,
President
Dickerson Inc.

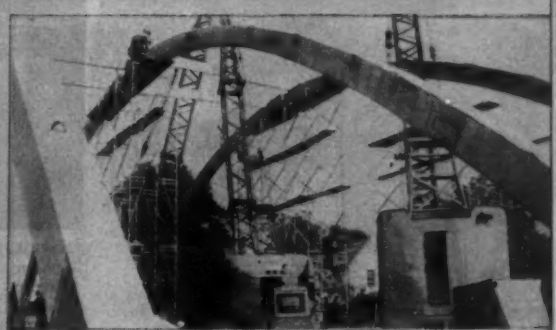
Past President Carolinas Branch AGC; Former Chairman of National AGC, Highway division; 10 yrs. on National AGC advisory board.

... a subscriber to CONSTRUCTION METHODS since 1939 says:

"I find CONSTRUCTION METHODS useful to me because of the variety of coverage it has on different types of construction. This has been particularly valuable to me since we have expanded our operations into many different kinds of construction requiring different techniques and equipment. I mark certain articles, and request my key men to read them. What's more, it's easy to read and the coverage of preventive maintenance is good. I look at the ads, too, for items we might use in our operation."



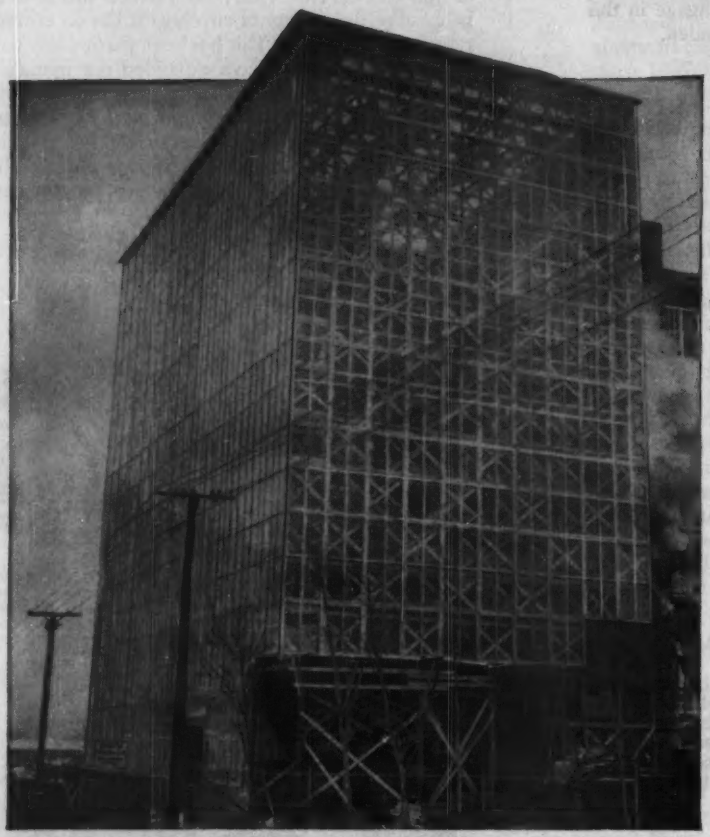
$2.2 million highway project — Lexington-Newberry counties, S. Carolina. Required 1.7 million cu yds of excavation, 482,003 sq yds of macadam base, 67,288 tons asphaltic concrete and 585,364 sq yds of bituminous paving.



Wingate College Gymnasium project valued at $206,500. Precast concrete arches and purlins cast on site and span of arches running 153 feet. Cranes shown moving arches into position.

Announcing... new, high-quality Du Pont Polyethylene Film

Early enclosure of building with Du Pont Polyethylene Film helps you maintain work schedules... cut costly delays!



ECONOMIC METHOD FOR EARLY ENCLOSURE. Allows work to continue despite inclement weather . . . doesn't cut off needed light. And when used on building frames, it can be retained under permanent siding as a moisture-vapor barrier.

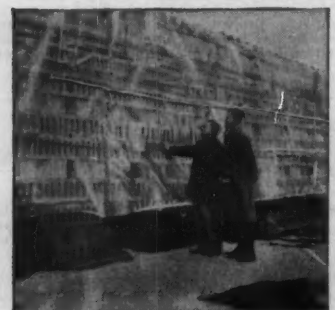
Here's a new, high-quality polyethylene film that will help you maintain work schedules, protect costly materials and provide a harder cure for concrete.

By specifying Du Pont Polyethylene Film, you can be sure of consistently high quality at the lowest possible cost. That's because Du Pont has over 35 years' experience in manufacturing industrial films, such as cellophane, acetate and "Mylar"* polyester film.

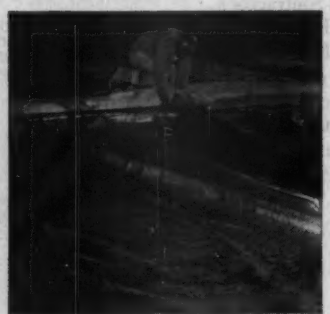
Tough, durable Du Pont Polyethylene Film is available in a wide variety of gauges, lengths and widths, assuring you the right film for every "on-the-job" use. **And, most important, suppliers of Du Pont Polyethylene Film, with years of experience and know-how, can provide helpful, cost-saving suggestions for using the film.**

When planning your next building start, check with your supplier of Du Pont Polyethylene Film. Ask for Du Pont's new "Specification Booklet" with suggestions that will help you cut costs . . . maintain work schedules . . . protect valuable equipment and materials. If your supplier is temporarily out of stock, write Room CM-12, E. I. du Pont de Nemours & Co. (Inc.), Film Dept., Wilmington 98, Delaware.

**"Mylar" is a registered trademark for Du Pont's brand of polyester film.*



PROTECTS MATERIALS AND EQUIPMENT. Keeps them safe from rain and dust . . . prevents materials from sticking or freezing together. Is lightweight, easy to handle, tough and durable.



PROVIDES HARDER CURE FOR CONCRETE. Economical . . . reusable . . . allows concrete to cure at a natural rate for greatest strength. Eliminates the need for repeated waterings . . . keeps dirt off.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

DU PONT polyethylene film

Out of the proven skill and experience of The Eimco Corporation comes the . . .

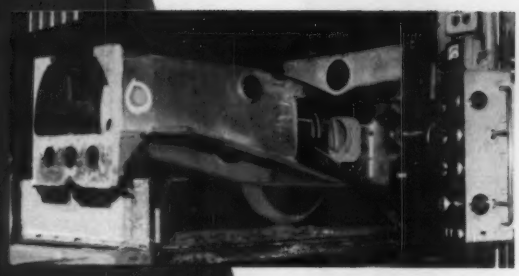
EIMCO 103

. . . A LINE OF TRACTORS THAT MAKES ALL OTHER CRAWLER-TRACTORS OLD FASHIONED!

The modern 100 HP

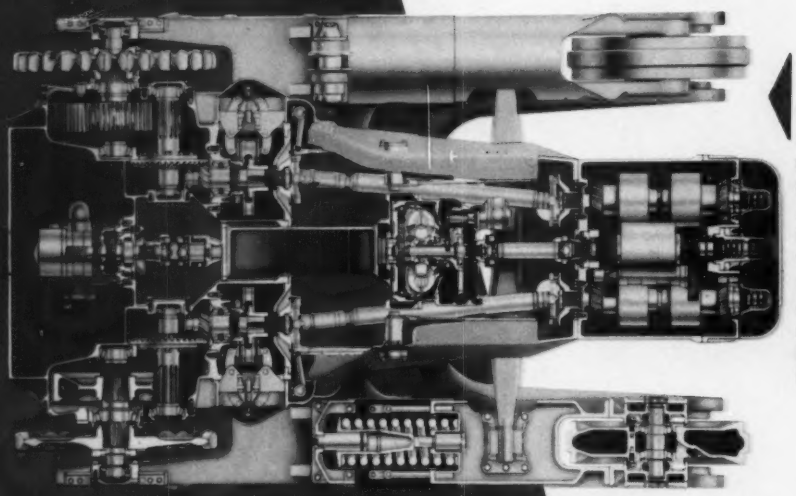
EIMCO 103 CRAWLER-TRACTOR LINE...

Features? Look . . .

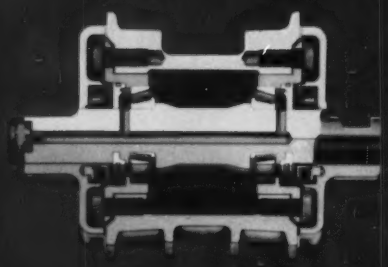


Main frame, Final Drives and Center Housing, produced, through Eimco's unique and exclusive Unitized "Stress Flow" Construction, in a single, strong steel casting, resists torque and stresses beyond any you can place upon it.

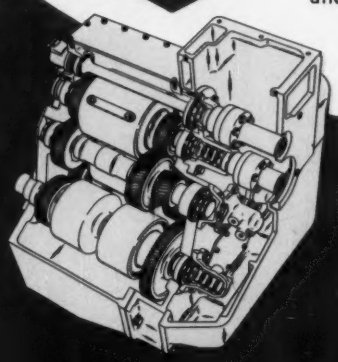
Thoroughly tested and proven, engineers checked and analyzed a precise and complete wooden mock-up before the first steel casting was made ... built in extra strength and rigidity where needed. No welds or bolts in this assembly! Just like the heaviest locomotives, it is built for many extra years of trouble-free operation, with no excess weight ... extra strength where it is needed.



Take a good look at this horizontal cut-away view of the modern 103 crawler-tractor. Here is perfection in engineering ... brilliantly simple ... ruggedly strong ... incorporating more exclusive and important "firsts" than any other crawler-tractor on the market today. Built by craftsmen who care ... the famous craftsmen and specialists of The Eimco Corporation, known throughout the free world for highest quality and dependability.



Eimco's famous "Unidrive", now combined with "Quadra-Torque", gives you a constant mesh transmission with hydraulic clutch control. Combined with heavy-duty industrial single-stage torque converter, permits shifts from forward to reverse and to any of the four forward or reverse speeds at any tractor or engine speeds. Includes oil-cooled positive engagement metallic clutches that never need adjustment! Dual Final Drives for independent track operation and spin turns!



Backed by the record-breaking performance and on-the-job proven engineering of the famous Eimco 105 line, which has recorded less than half the maintenance costs of other makes . . .

The great 100 HP Eimco 103 Series challenges comparison!

The first modern tractor specifically engineered and built to fill your power, size and work needs in the 100 HP class . . . the perfect medium size tractor, from Eimco . . . pioneers in **modern** tractor design and engineering.

We invite you to compare. Write for free comparative Fact Sheets, listing and comparing all the leading makes of crawler-tractors, component by component, feature by feature. Compare, and you too will choose the modern, reliable, extra-value Eimco . . . which offers these and many more exclusive features:

"Quadra-Torque" . . . new, modern power team, offering four forward and four reverse speeds at the flip of a lever through heavy-duty single stage torque converter. Lets you shift from any gear, forward or reverse, to any other, at any tractor or engine speed.

"Unidrive" and Dual Final Drives . . . Patented Eimco transmission, offering independent track operations for smooth, safe spin turns as well as usual brake turns. Features transmission gears that never reverse rotation. Simple and reliable.

Unitized "Stress-Flow" Construction . . . newest Eimco development. Large, strong steel castings are molded to shape and thickness' required to withstand the most extreme stresses. Main frame, final drives and center housing one strong steel casting. No bolts or welds. Components easily accessible. New, greater strength and rigidity.

Self-cleaning Air Cleaner . . . first from Eimco! Completely eliminates ordinary routine cleaner maintenance. No need to even open the air cleaner more often than every 500 to 1,500 hours! Unique rear mounted dual-fan arrangement cools by suction, instead of blasting radiator core with sand and grit.

Up-front Operator Position . . . for maximum visibility and operator control.

Full 17-inch Ground Clearance . . . can climb 90% grades, forward or reverse.

Simple Controls . . . with power shifting. No clutch. No stalling. Flip-of-the-lever gear controls forward or reverse, in all four speeds.

Completely enclosed Brakes! Hydraulic Track take-up! Track Frame and Diagonal Brace one-piece heavy steel casting!

Over 33,000 lbs. Drawbar Pull . . . with adequate traction.

FULL ONE-YEAR GUARANTEE ON THE ENTIRE TRACTOR, INCLUDING TRANSMISSION!

The modern Eimco 103 Line of Crawler-Tractors is available in these models:
Eimco 103 Tractor and Dozers
Eimco 123 Front End Loader
Eimco 133 Special Steel Mill FEL
Eimco 143 Log Loader

Get all the facts! Write for specifications and comparative Fact Sheets. Address: The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah, U.S.A.

THE EIMCO CORPORATION

EIMCO

TRACTOR LOADER DIVISION

634 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

I - 468

The MODERN line of EIMCO CRAWLER TRACTORS also includes . . .

THE FAMOUS EIMCO 105

Proven in use around the World, this maneuverable, economical crawler is available as a bare tractor; in six models of Dozers; Model 105 Excavator; Model 115 Special Steel Mill Excavator; Eimco 135 Special Steel Mill Front End Loader. Cummins (130 HP) or GMC Diesel (143 HP) Engines.

THE POWERFUL EIMCO 106

Featuring 205 working H P, the 106 is available as tractor, dozers, the world's most powerful Front End Loader (Model 126) and Special Steel Mill Front End Loader (Model 136) as well as the famous Eimco 146 Log Loader. Features Eimco maneuverability, economy and quality.

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"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

THE EIMCO CORPORATION

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BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

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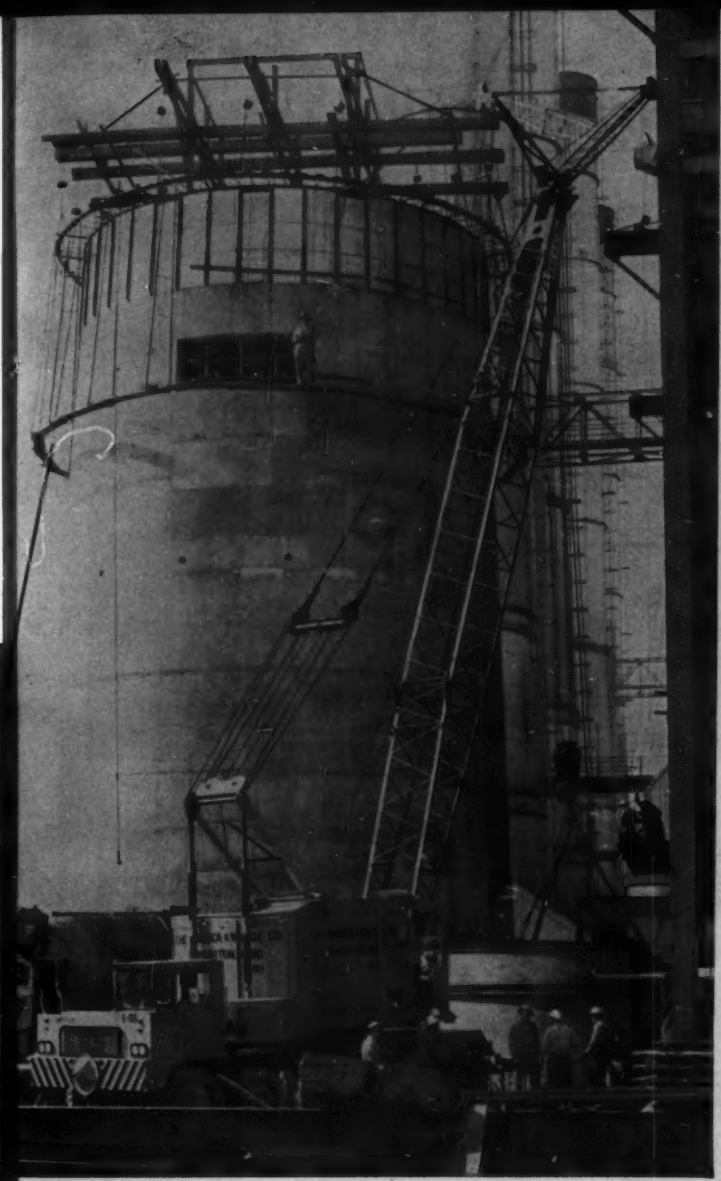
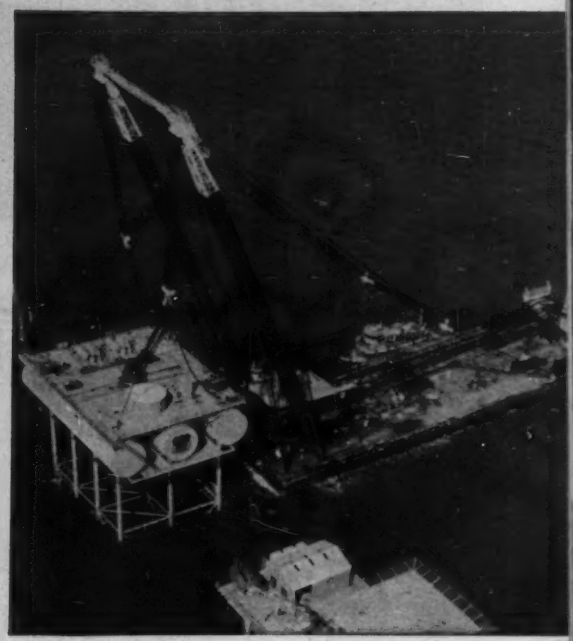


Setting 8 Tons or 800 Tons...

AMERICAN AIR CONTROLS DO THE JOB SAFELY, SMOOTHLY WITH UNEQUALLED ACCURACY



Here is proof-positive of the all-around *superiority* of American Air Controls. Illustrated at right is the world's largest floating lifting device, an 800-ton capacity air-controlled American Derrick, owned by the J. Ray McDermott Co., Harvey, La. Setting the world's record lift in its builder's trials, this mammoth derrick has since provided safer lifting for scores of difficult jobs such as this one. Here American air controls were relied on to set in place a massive off-shore drilling platform in the Gulf of Mexico. Air controls were employed because their reliability has been proven time after time on the most delicate and costly heavy-duty jobs.

For handling smaller loads . . . your heaviest loads . . . you can count on American air controls for accuracy, with safety.

As demonstrated in the larger illustration, workmen have complete confidence in the reliability of an American 500 Series Truck Crane, *with Air Controls*, throughout a skillful powerhouse erection job.

Whatever your job demands are, there's no reason why you can't use American Air Controlled equipment for easier, safer lifting.

American Hoist has pioneered air control design and construction for almost three-quarters of a century. Today, American equipment is better than ever . . . better than any. Contact your American Distributor now for detailed and illustrated catalog information on American equipment.

DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

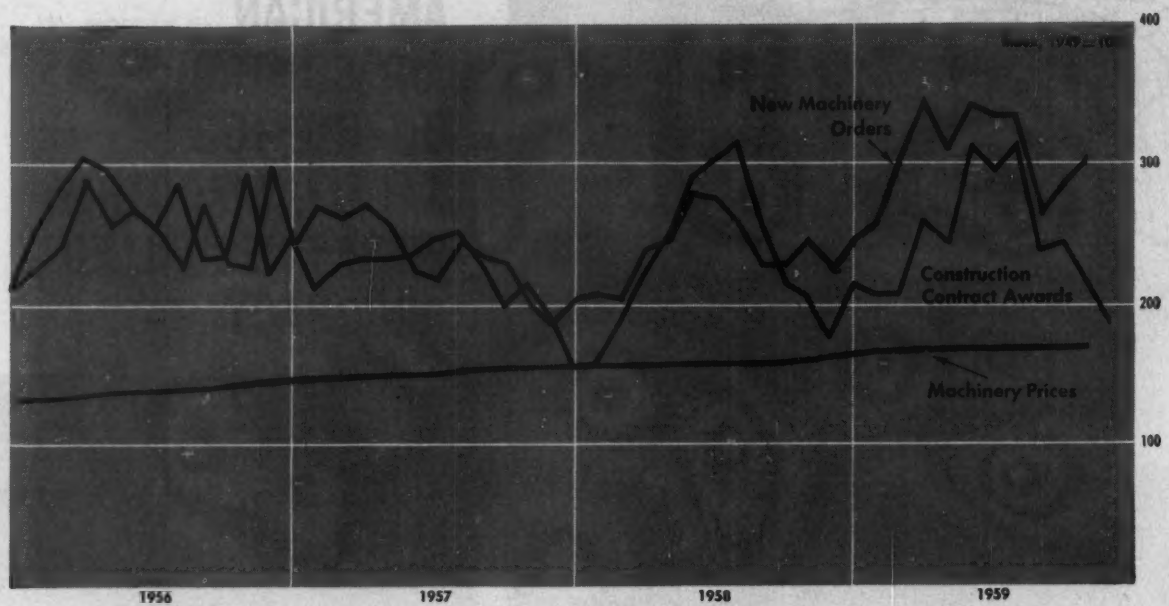
EXCAVATORS-CRANES to 2 yds.-60 tons
LOCOMOTIVE CRANES to 130 tons

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

Trends in the Machinery Market



Price Index

	OCTOBER 1959	MONTH AGO	YEAR AGO	% CHANGE 1958-1959
All Types of Equipment	172.6	172.6*	166.8	+ 3.5
Cranes; Draglines, Shovels	170.5	170.5	165.6	+ 3.0
Shovel, ½ cu yd	165.0	165.0	156.2	+ 5.6
Shovel, ¾ cu yd	173.9	173.9	170.2	+ 2.2
Shovel, 1-1½ cu yd	184.3	184.3	180.7	+ 2.0
Shovel, 2-2½ cu yd	164.7	164.5	156.6	+ 5.1
Shovel, 3-3½ cu yd	167.8	167.8	162.7	+ 3.1
Shovel, 6 cu yd	195.0	195.0	184.1	+ 5.9
Crane, truck mounted	166.2	166.2	164.2	+ 1.2
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	157.5	157.5	152.7	+ 3.1
Bucket, dragline	169.3	169.3	180.8	— 6.4
Scrapers and Graders	165.7	165.7	158.8	+ 4.3
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	156.8	156.8	151.3	+ 3.6
Scraper, 2 Wheel, 15-19.5 cu yd (a)	123.7	123.7	122.7	+ 0.8
Grader, heavy duty	172.6	172.6	164.0	+ 5.2
Grader, light & medium	171.1	171.1	161.2	+ 6.1
Tractors (non-farm, incl industrial)	187.8	187.8	180.5	+ 4.0
Wheel-type, off highway (a)	128.2	128.2	128.4	— 0.2
Crawler-type, 50-74 dhp	191.9	191.9	185.3	+ 3.6
75-99 dhp	196.4	196.4	188.5	+ 4.2
100-154 dhp	191.3	191.3	186.7	+ 2.5
155-190 dhp	201.3	201.3	191.8	+ 5.0
Machinery, Tractor Mounted	168.6	168.6	162.1	+ 4.0
Dozer, cable controlled	154.4	154.4	151.6	+ 1.8
Dozer, hydraulic controlled	186.6	186.6	177.3	+ 5.2
Cable power control unit	151.4	151.4	147.9	+ 2.4
Loader, shovel type	161.5	161.5	155.1	+ 4.1
Specialized Machinery	158.6	157.9*	150.7	+ 5.2
Ditcher	156.6	159.2*	154.1	+ 5.1
Roller, tandem	220.2	220.2	193.2	+14.0
Roller, 3 wheel	174.9	174.9	161.6	+ 8.2
Ripper and rooter	150.5	150.5	145.3	+ 3.6
Dewatering pump, 10 M gph	110.3	110.3	111.7	— 1.3
Dewatering pump, 90 M gph	151.0	150.5	144.3	+ 4.6
Portable Air Compressers	167.5	167.5	159.1	+ 5.3
Contractor's Air Tools	181.6	181.6	164.6	+10.3
Mixers, Pavers, Spreaders	157.5	157.3*	150.1	+ 4.9
Mixer, portable, 11 cu ft	165.9	165.9	160.1	+ 3.6
Mixer, portable, 16 cu ft	172.2	171.0	163.7	+ 5.2
Mixer, truck, 6 cu yd	132.4	132.4	127.3	+ 4.0
Mixer, paving, 34 cu ft	193.5	193.5	183.9	+ 5.2
Concrete finisher & spreader	196.7	196.7*	181.5	+ 8.4
Bituminous distributor	122.3	122.3	122.4	— 0.1
Bituminous spreader	170.2	170.2	160.3	+ 6.2
Bituminous paver	167.4	163.0*	153.0	+ 9.4
Off-Highway Trucks, Wagons (b)	101.1	101.1	100.6	+10.5
Contractors off-highway truck (b)	101.1	101.1	100.6	+10.5
Trailer dump wagon (b)	101.4	101.4	101.4	0

• (a) January, 1955=100 • (b) January, 1958=100 *Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49=100

Equipment Sales Move Still Higher

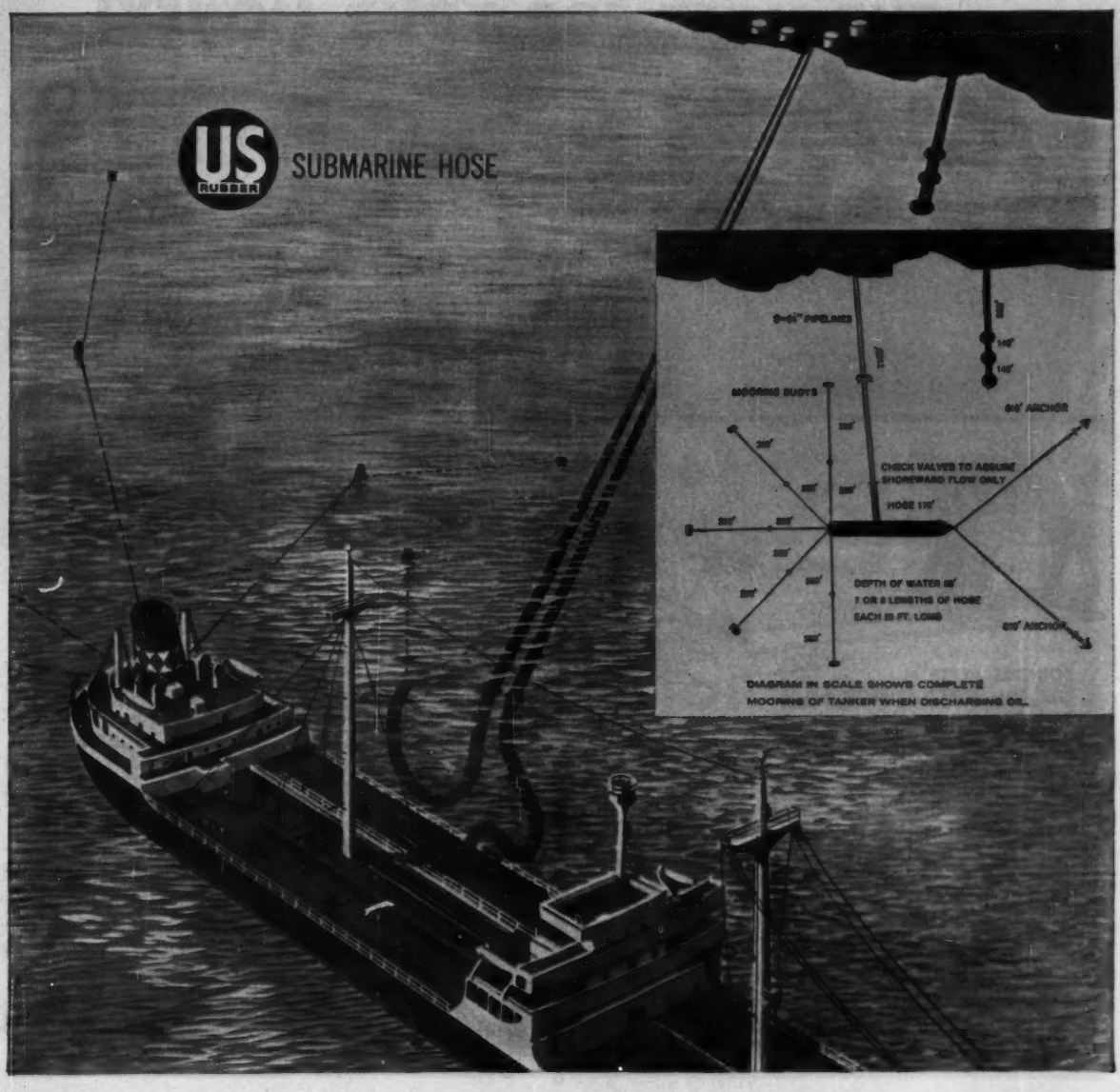
DESPITE A DROP in new business, construction contractors increased their new orders for equipment in October. This second consecutive monthly increase since the August low pushed orders to a record for October. The McGraw-Hill Economics Department index of manufacturers' bookings his 298 based on 1949 = 100.

Though equipment orders usually follow closely the trend in construction contracts reported by *Construction Methods*, they broke away in October. Orders rose 4% while contracts fell 24%. Thus the strong uptrend in equipment buying since early 1958 continues. For the first 10 months of this year, new orders were 28% ahead of 1958. By contrast, contract awards this year are only 4% above 1958, according to *Construction Methods* figures.

There are several possible reasons why equipment buying is stronger than the trend in contractors' new business:

- Prospects of delivery delays due to the steel shortage forced some manufacturers to curtail production in October. Many contractors may have decided it's safer—and perhaps cheaper, too—to order replacements further in advance.
- The outlook is for a strong recovery in highway and bridge construction contracts in the first half of 1960. And industrial building plans are likely to be rushed next year to make up for delays caused by the steel strike.
- Competition is pushing to the sidelines those contractors who don't have top efficiency and who therefore can't make profitable winning bids.

Awards recovered in November as the Contract Index climbed 22% from 190 to 232, based on 1949 = 100. Nearly every major type of work rose.



From tanker to shore...the hook-up is U.S. Amazon Hose

The only submarine unloading point for oil tankers on the East Coast is at the Northville Dock Corp., Long Island, N.Y.

The operators say that submarine unloading would be impossible without hose of this character. Foreign and domestic tankers use this undersea hose (7100 feet offshore) as a hook-up to pipelines discharging heavy and light fuel oil directly into storage tanks on shore. Expensive dock and wharfage facilities are eliminated. *The tankers are moored at sea.*

The U. S. Amazon® Hose H2323 in use here resists the corrosive action of salt water and the turbulent action of swift tides. Its lightness and flexibility enable crew members to make it fast to the deck headers in record time. Also it curves easily from the water to the deck. There is never any sharp bend to impede flow.

Similar installations for other oil companies are located at world-wide points, proving the soundness of the construction features and the over-all quality of U. S. Amazon Hose.

• • •

When you think of rubber, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

Mechanical Goods Division

United States Rubber

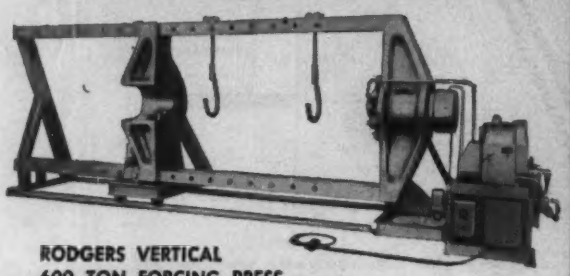
WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

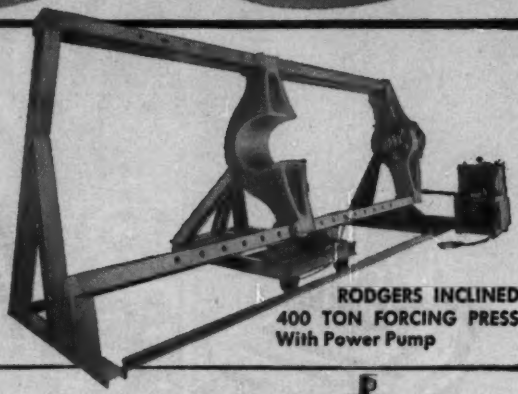
THE MOST FOR YOUR MONEY!...

Rodgers Forcing Presses

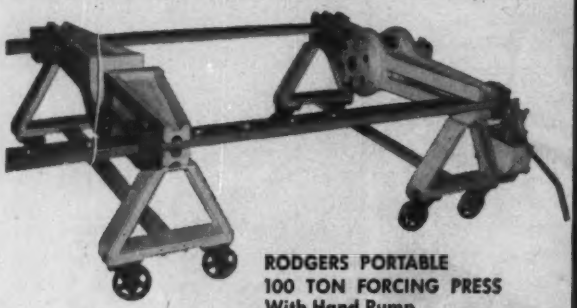
Greater Versatility **Rugged Power** **Flexible Controls**



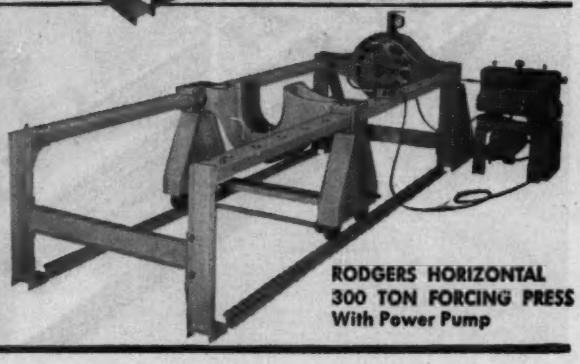
RODGERS VERTICAL
600 TON FORCING PRESS
With Adapters and Hooks



RODGERS INCLINED
400 TON FORCING PRESS
With Power Pump



RODGERS PORTABLE
100 TON FORCING PRESS
With Hand Pump



RODGERS HORIZONTAL
300 TON FORCING PRESS
With Power Pump

When you buy a Rodgers Forcing Press, you are not tying up your money in a single purpose tool. Compared with other presses, Rodgers design permits a wider variety of jobs to be handled—from the full tonnage capacity of the press, on heavy duty work, to partial capacities required for light jobs.

Rodgers Press design also offers unique flexibility in the interchangeability of cylinders and power source. Each press can be easily modified to suit changing job requirements. And an "extra" feature is the simple way the cylinder and pump may be detached for jacking, pulling and pressing work in the shop or field. Rodgers positive, accurate controls may be used at the press or remote.

When you check Rodgers Forcing Presses, feature for feature, their rugged construction, fast, positive action, and the variety of adaptors, hooks and other accessories available, you will be convinced that a Rodgers will give you the *most* for your money.

Rodgers Forcing Presses are available in standard, horizontal, vertical, inclined and portable models... capacities from 100 to 600 tons... with power or hand pumps.

Write for Catalog No. 315A . . . it gives complete details and specifications.

HYDRAULICS Rodgers KEEP THE WORLD MOVING

RODGERS HYDRAULIC, Inc.

Pioneers in High Pressure Hydraulics Since 1932

7403 WALKER STREET • MINNEAPOLIS 26, MINNESOTA

This overall view of Schmidt's two crushers show how the five International engines help give high production at low cost.

5 Internationals major power on high output double crusher setup

Schmidt Const. Co., Arvada, Colo., uses International engines for major power in this double crushing plant that provides base rock and aggregate for surfacing 18 miles of U. S. 285 north from Fairplay, Colo.

The semi-electric Cedar Rapids 2x Super Commander crusher producing 3-in. minus base rock is fed by a Kolman conveyor powered by an International U-281 gasoline engine. An International UDT-1091 turbocharged diesel on a 158 KVA generator supplies electric power for this same crusher.

The second crusher, producing ¾-in. minus material for the asphalt mix, uses three International engines in this manner: U-281 on conveyor feeding UDT-1091 powered scalping unit; and another UDT-1091 turbocharged diesel driving the Symonds short head cone crusher.

For crushers or any of your powered construction equipment, International diesels or carbureted engines give you dependable low cost performance that pays off in most profitable contract completions. Your International Power Unit Distributor or Dealer sells and services 24 models ranging from 16.8 to 385 max. hp. See him for your best deal at repower time or specify International in your new machines.

Supt. Frank Gamara, shown above, says, "We have a well balanced plant here that is giving us high production at low cost. The engines are mostly International with three big UDT-1091 turbocharged diesels supplying the bulk of our power needs. We have used them on other plants and have gotten fine results through years of hard work in the dustiest of conditions. An engine needs lots of guts to keep the crusher rolling. The snappy response of the UDT-1091 when the governer opens up really holds up the crusher's rpm's. Internationals are excellent power for fine crushing equipment."

International® Construction Equipment

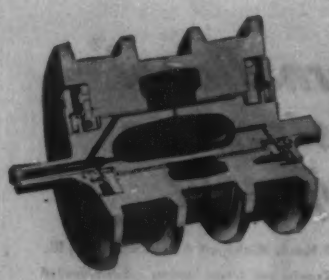
International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors...Self-Propelled Scrapers and Bottom Dump Wagons...Crawler and Rubber-Tired Loaders...Off-Highway Haulers...Diesel and Carbureted Engines...Motor Trucks...Farm Tractors and Equipment.

TD-25 power-steering plus

team new 230 diesel hp, new traction...

You "gain ground" on all four steps of the push-loading cycle with the torque-converter TD-25. (1) you slow-down by power-shifting down and using decelerator to get feather-touch contact; (2) power-shift either track up or down to maintain solid pusher contact on curves; (3) get gear-higher kick-outs with on-the-go power-shifting; (4) reposition faster, with higher-than-ordinary reverse!



Dual-protected TD-25 Dura Rollers have precision-fitted, metal-to-metal cartridge-type sealing—to exclude abrasives and retain lubricant. These rollers have pressure relief passages so they can be power-lubricated—without affecting seal life or efficiency. Dura Rollers have king-size lube reservoirs, to make twice-a-year lubing practical!

s on-the-go Hi-Lo power-shifting

on...to outearn other rigs up to 50%!

You Power-Steer and Power-Shift the new International TD-25, with 2-finger ease! Exclusive, years-proved Planet Power steering gives you full-time "live-track" power and traction to make full-load turns and eliminate "dead-track drag." Hi-Lo on-the-go power shifting instantly matches power to conditions to prevent losing momentum!

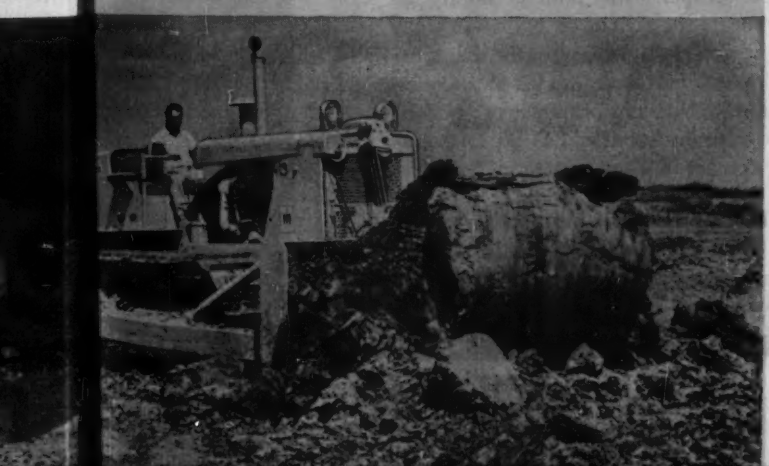
Exclusive Efficiency-Range Control
Exclusive International Hi-Lo power shifting makes the TD-25 the industry's only 4-speed torque-converter crawler, and the only one with load-matching, efficiency-range control. In the synchro-mesh transmission TD-25, the Hi-Lo planetary system gives eight speeds forward and reverse—with cycle-speeding up-or-down, on-the-go shifting!

You get big-capacity teamwork of 230 diesel horsepower with the new 7-roller tracks, platformed on super-rugged, double-box-beam frames—and carried on International's new minimum-maintenance Dura Rollers! Over 39 square feet of ground-gripping traction area harness the "25's" great power!

You simply press the direct-start button, to command the "25's" free-breathing diesel horsepower. Dual valving of the "25's" high-torque DT-817 engine provides for peak turbocharging efficiency—to deliver full-rated power from sea level to timberline!

Full performance is at your fingertips, full time. No wonder the TD-25 outearns same-sized clutch-steered crawlers up to 50%—on a wide range of tough jobs!

You don't spill the "pay" part of your load with the TD-25—even when you change speed making the "pass." Hi-Lo on-the-go planetary shifting keeps the blade fully loaded—even when dozing round curves, benching, or side-casting! See how the "25" can help you pocket bigger profits.



SIZE UP TD-25 PLANETARY DRIVE DESIGN that breaks the load-limiting, time-losing steering and shifting bottlenecks—which plague king-sized, clutch-steered crawlers.

COMPARE NEW TD-25 FULL-LOAD, FULL-TIME ABILITY, to outearn other same-sized rigs—up to 50%! Let your International Construction Equipment Distributor demonstrate!

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

PROBLEM:

How to demolish and load out foot-thick brick-and-concrete wall

SOLUTION:

New TD-15 Four-in-One!

Before you're "up against a brick wall;" do what Fessenden & Co., El Cerrito, California—and thousands of other contractors—have already done! Tool up for tough, multiple-operation jobs with the one-man operated, one-price 4-in-1! If you've been buying old-style, limited-duty rigs, without trying the machine that's making 'em obsolete, take time for a hard-headed comparison!

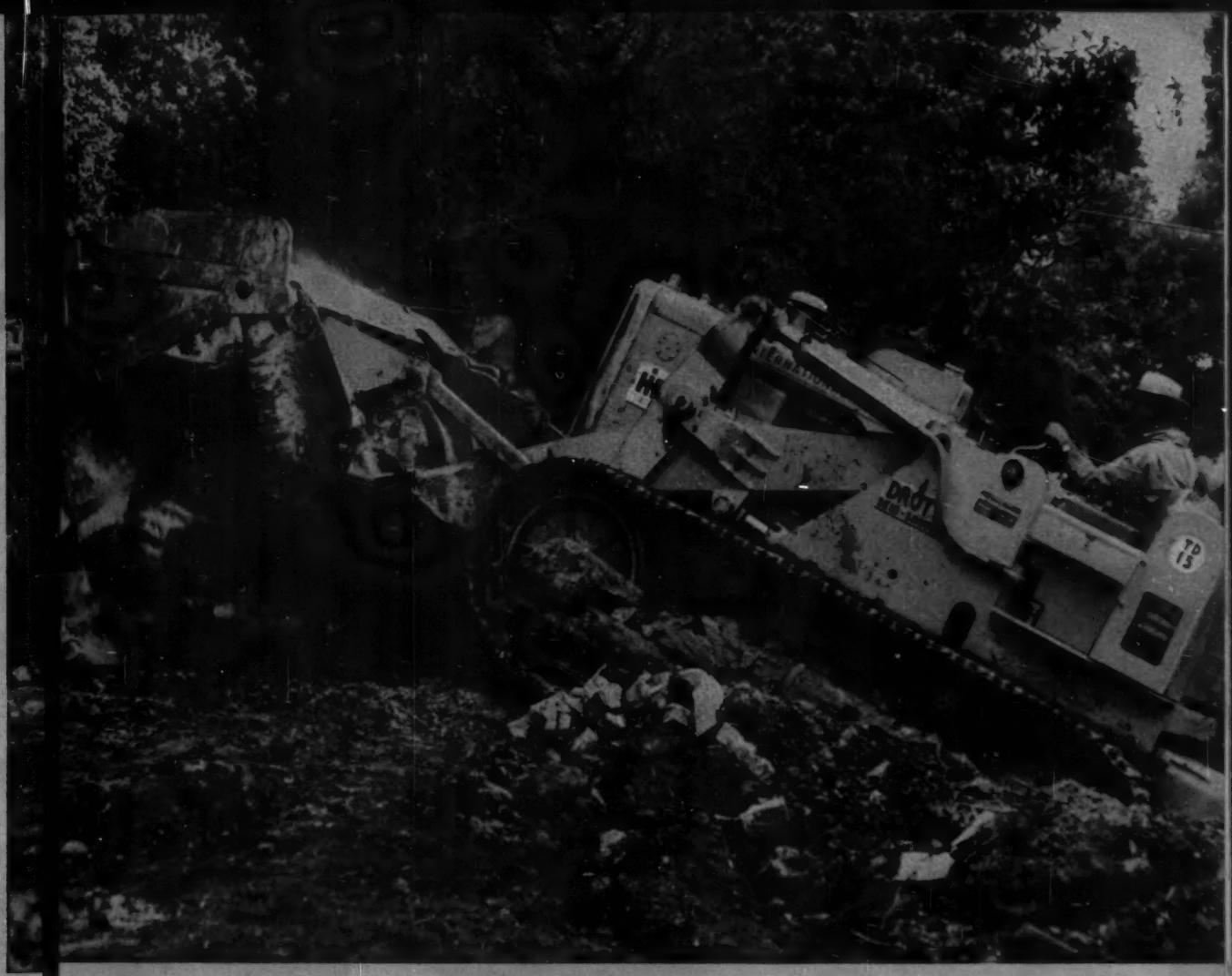
You grasp the 4-in-1's "machine-selector" lever—instantly a whole new world of construction business opportunities is at your fingertips! It's a wide, heavy-duty, material-moving world.

Until the 4-in-1 arrived, this was the private "world" of old-style, "single-action" loaders; of bulldozers; of grading machines; of power shovels and draglines; yes, even of dynamite!

See what it means to command the genuine pry-over-shoe break-out action; the exclusive 4-machine utility of Skid-Shovel, clamshell, bulldozer, and "carry-type scraper"—the built-in ability to duplicate the actions of "big-ticket" rigs, right and left! Measure the big plus value of exclusive, shock-swallowing Hydro-Spring performance protection! See your International Drott Distributor for a 4-in-1 demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT



Back-dragging with the clam, like a bulldozer in reverse—then pushing with forward dozing action—the TD-15 Four-in-One tears down a foot-thick old brick-and-concrete masonry wall. Fessenden & Co., El Cerrito, California, is clearing an old Berkeley residential site for a new apartment building. This contractor owns four International Drott 4-in-1's!

Using 4-in-1 bulldozer action with clam raised, the Fessenden operator "turns on" the TD-15's 115 hp, and "blasts out" another section of concrete wall. "It's a hard-digging dozer, a wonderfully fast loader that can pick up heavy debris in the clamshell—our 4-in-1 is the one machine that does everything!" states operator Elmer Hope.

Genuine pry-over-shoe break-out action enables the Fessenden's 4-in-1 to exert the tremendous force of 39,200 lbs., and up comes an "anchored" section of concrete foundation. This one, big-capacity unit does the demolition, loading, and grading without benefit of power shovel or blasting crew help!

Match the truck to the job

Matching the right equipment to the job is one way successful contractors stay on top in today's highly competitive construction market.

Campanella & Cardi Construction Co., of Hillsgrove, Rhode Island, one of New England's leading contractors, knows that hauling costs go down when trucks are matched to the job. That's why you'll find models for every type of construction job always available in their 100-Mack fleet . . . models like these Mack LVX 22½-tonners used to handle the bridge approach work on their recent Fall River, Mass., expressway project.

Mack offers the most complete line of dumpers for mining, quarrying, road building, construction . . . from heavy-duty 150-horsepower, four-wheel dumpers with 5- to 10-yard capacities, to super-duty 450-horsepower, six-wheel dumpers with 40-ton capacities . . . each with the built-in capacity, dependability and economy traditional with Mack trucks.

See your Mack branch or distributor for full details on the models best suited to your requirements. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ontario.

7201

MACK
FIRST NAME FOR
TRUCKS

There are Macks for every construction job. Here are 35 of Campanella & Cardi's 100-Mack fleet ready to tackle a new assignment.


CAMPANELLA & CAR

Outlook For 1960 Is Bright

PROSPECTS of a big year for new business in 1960 have brightened substantially within the last two months. This is mainly because of the very sharp rise in new construction projects entering the planning stage. Much of this work will be ready for bids sometime next year. But a second reason is that the federal-aid highway construction program is set for a much better year in 1960 than in 1959.

October and November saw more new proposed heavy construction go on the drawing boards of architects and engineers than any other two-month period since the boom days of early 1956. In the last two months, projects with an estimated construction cost of more than $5.1 billion were proposed, according to *Construction Methods* figures. This is close to the peak rate set in the 1955-56 boom in proposed work which preceded the record contract awards signed up by contractors during 1956.

Moreover, this new strength in the construction market is reflected across the board—in private construction, federal, state, and municipal public works.

Private work shows the biggest increase, with proposed work jumping 45% ahead of 1958 during the first 11 months of this year. Federal plans are up 12%, and state and local proposed projects are up 5%. The gain in state and local work is not big because plans didn't start their upswing until late in the year—August. So a good part of the upsurge during the last four months was needed to offset a 1958-1959 deficit of 5% at the end of the first seven months.

Waterworks, dams, irrigation projects, and buildings are responsible for the increase in state and local construction plans. Missile bases, dams, irrigation, flood control and harbor development have sparked the rise in proposed federal construction.

The total of all proposed work reported so far this year by *Construction Methods* is a thumping 23% ahead of 1958's relatively low volume. The $18.5—billion total is about evenly split between private and public work. These new projects going on the drawing boards show a much greater increase than the 6% rise in contract awards reported by *Construction Methods* during the first 11 months of this year. Though the gain in contracts has been held down by the steep slide in highway awards due to cutbacks in federal aid, this doesn't detract much from the implications for future contracts of the recent surge in new plans. In fact, new proposed construction other than highways and bridges is up 28% or more than double the 13% rise in contract awards for these types of work.

Steel Outlook Helps

The particularly sharp rebound in proposed industrial plans is very important because it forecasts a resumption in 1960 of this year's sharp recovery in plant construction contracts. The recovery in industrial awards this year began to falter in October when it became apparent to some owners that the prolonged steel strike was bound to create serious, if short-lived, steel supply bottlenecks.

In addition to those prospective buyers of industrial construction who held back, there were others who evidently decided to go easy on starting plans for new plants. This was reflected by a rather sharp drop in new proposed plants starting in June when a steel walkout first appeared imminent.

But industry has apparently decided in recent weeks that it's better business to go ahead with plans now rather than to wait for all the uncertainty as to steel availability in 1960 to be cleared away.

The fast pace at which steel mills returned to near-capacity

New Proposed Construction — 11 Months 1959

Reported by Construction Methods & Equipment in millions of dollars

TYPE OF WORK	1956	1957	1958	1959	Change 1958-1959 %
All Construction	$23,891	$19,033	$15,040	$18,488	+ 23
By Ownership —					
Private	11,979	8,374	6,333	9,200	+ 45
Public	11,912	10,659	8,707	9,288	+ 7
State & Municipal	10,019	8,925	6,523	6,837	+ 5
Federal	1,893	1,734	2,184	2,451	+ 12
By Type of Work					
Waterworks	497	453	465	503	+ 8
Sewerage	563	556	710	708	— 0.3
Bridges	438	617	411	407	— 1
Highways	2,349	2,242	1,724	1,614	— 6
Earthwork — dams — waterways	774	1,613	635	827	+ 30
Public Buildings	4,656	3,995	3,684	3,890	+ 6
Private Building	11,035	7,408	5,949	8,300	+ 40
Industrial	5,587	3,067	1,255	2,899	+131
Commercial	2,453	2,321	2,663	2,444	— 8
Mass Housing	2,996	2,020	2,031	2,957	+ 46
Unclassified, public*	2,635	1,183	1,078	1,399	+ 30
Unclassified, private#	943	966	384	900	+134

*Mainly airports #Mainly pipelines, transmission and distribution lines. Incl. private bridges: $9.2 mil. in '59; $0.7 mil. '58; $0.2 mil. '57; $14.1 mil. '56.

engine power
BY CATERPILLAR

How excavator repowering can be simplified

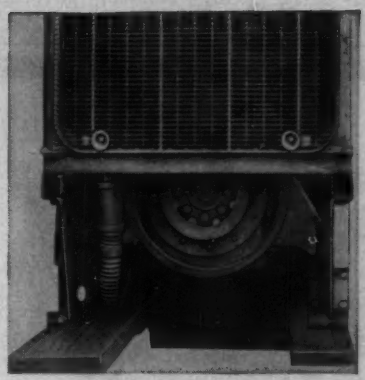
OFTEN a limited engine selection can make the job of repowering an excavator seem complex. It's true that an incorrect choice can make revamping costly. Adapting a poor choice can tie up equipment when it should be working.

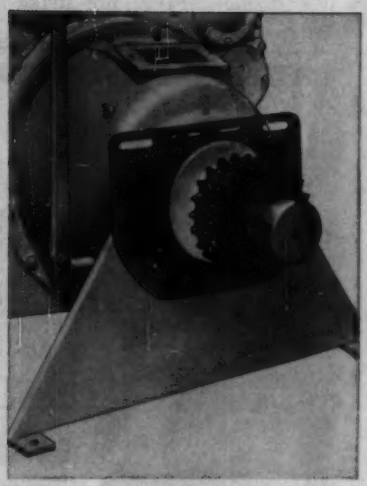
Caterpillar Engines have simplified repowering and have given equipment owners greater profit for over 25 years. Caterpillar makes a complete range of basic engine models from 50 HP to 730 HP requiring no extensive equipment redesign to repower a wide range of machines. Cat Diesels are planned to meet any repowering need . . . mobile . . . stationary . . . mechanical . . . electric . . . 50 or 60 cycle . . . combinations of mechanical and electric . . . natural gas engines in 7.5:1 and 10.5:1 compression ratios. And these engines are available with power transmission for *your* equipment.

When you get a Caterpillar Engine you get fast delivery. Repowering time is kept to a minimum. And you're sure to get the right engine for your machine, hence you're sure of getting improved performance. Repowering returns are high and usually come fast when you choose a Caterpillar Engine.

An experienced Caterpillar Dealer Engine Specialist can help you with repowering. He'll analyze your specific power needs. He'll make recommendations that can increase your machine's profitability. And he'll supervise installation.

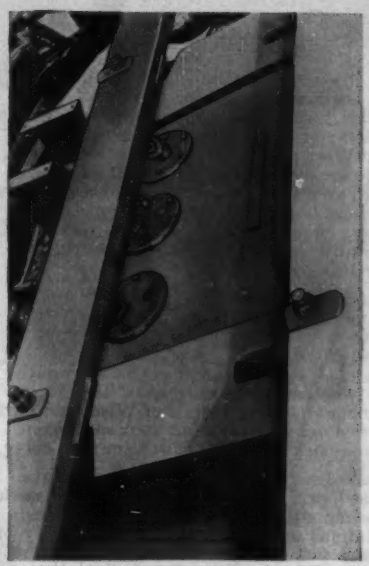
For more information write for the "Construction Equipment Repowering Packet" which outlines the many avenues of repowering profitability.

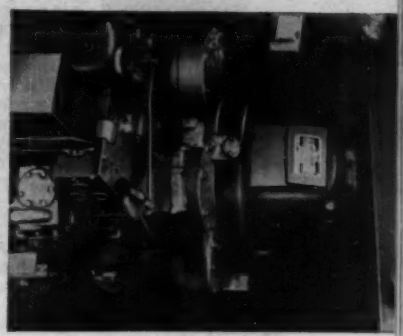




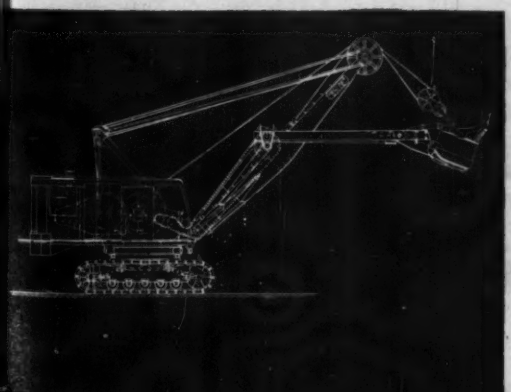
Photos show how easy repowering actually is with Cat Engines. A standard Caterpillar arrangement was selected for this shovel and set at 950 RPM to deliver 263 HP. The engine replaced had produced 215 HP.

This is the clutch with sprocket drive and shaft support plate. Bracket was welded onto chain case to hold engine and case rigid. The radiator is 7" from the side of cab.





Conversion completed. The increased production, minimized downtime convinced owner to repower two additional machines.



Engine was mounted on two 10", 20 lb. channels. Channels were cut to fit, allowing sliding room for clutch removal. Bolt holes were cut for base and engine mounting. Slight modification was done to chain case to clear end of stub shaft. A plug opening was made for greasing the clutch pilot bearing.

CATERPILLAR

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

operations is encouraging because it means that deliveries of construction steel won't be held up for long. Moreover, fabricators are expected to cut a substantial chunk out of the delays encountered in obtaining mill shipments. This is because the fabricators' backlogs did not build up much during the long steel strike. In fact, they have been able to keep going at a surprising rate, utilizing heavy pre-strike inventories and showing an amazing resourcefulness to locate scarce steel items.

But the steel supply picture remains clouded by the threat of another walkout when the 80-day "cooling off" period expires late next month. The construction industry has its hopes riding on the possibility that the steel industry will sign a new labor contract before then. The alternative is, many believe, government action to force a settlement.

Though industrial plans made a snappy comeback last month, the slack period of June-October will probably result in a reduction of plant construction awards during the early months of 1960. However, the latest upturn in proposed plants indicates that awards will snap back by spring and resume the rate of growth scored during the first nine months of this year.

Roadbuilding Plans

By contrast with their disappointing 1959 performance due to federal aid cutbacks, highway and bridge contracts will be among the pacesetters in 1960's expanding construction market.

A sharp rebound in highway and bridge awards is due to break loose in the first half of 1960. Awards should set a January-June record for federal-aid projects (though they won't be up to the six-months high set in July-December of 1958 when highway work was speeded to help pull the country out of the 1957-1958 recession).

A record first half will be followed by a lower second half—unless Congress changes the financing basis of the interstate program at next spring's session. The full 12 months of 1960 should see a jump of at least 20% over 1959 federal-aid highway and bridge construction contracts. But the total of $3.1 billion forecast by *Construction Methods* for 1960 will fall 13% short of 1958's record $3.55 billion.

About three-quarters of the state highway departments plan to obligate by next June 30 all of the federal aid that's available to them for fiscal 1960. Based on these reports, 29 states should let more federal-aid highway and bridge awards in the first half of 1960 than they did in January-June of 1959.

SOME BIG CONTRACT AWARDS OF THE MONTH

Robert E. McKee General Contractors, Inc., 4701 San Fernando Rd., Los Angeles 39, Calif. Construct 12 buildings at the International Airport in Los Angeles.

continued on page 53

Great new things are shaping up in concrete block

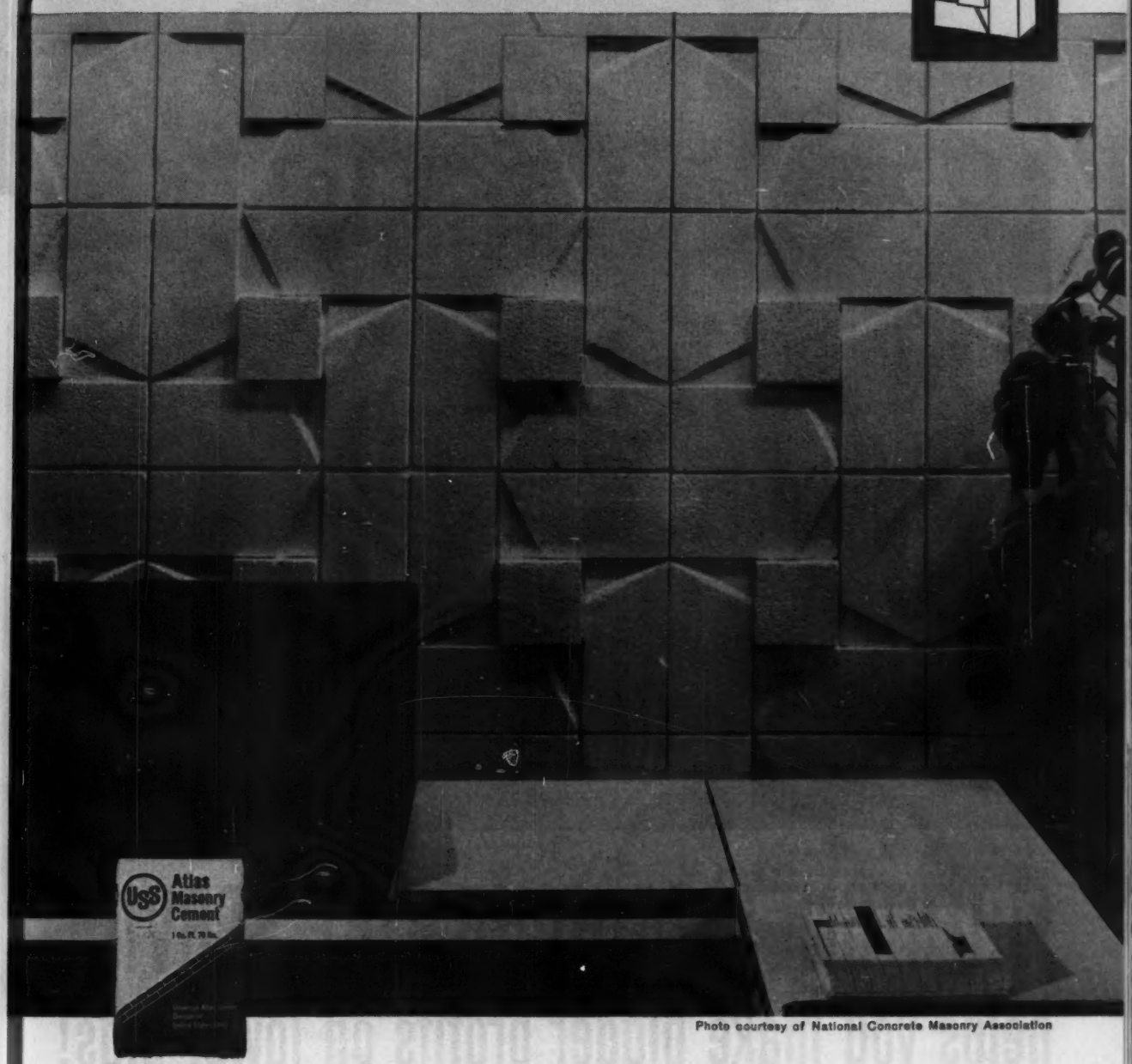


Photo courtesy of National Concrete Masonry Association

Atlas Masonry Cement provides the right mortar

"Shadowal" concrete block has often been described as "the block with a thousand faces." Used here in combination with square blocks by Architect Mario J. Ciampi, San Francisco, this unit has created a striking and distinctive example of the role concrete block plays in today's building plans. And to lay up the new concrete masonry units, Atlas Masonry Cement continues to be the preferred cementing material for mortar. It helps produce a smooth, workable mortar . . . assures a stronger bond . . . gives weatherproof joints that are uniform in color. And Atlas Masonry Cement complies with ASTM and Federal Specifications. For information write: Universal Atlas Cement, Dept. M, 100 Park Avenue, New York 17, N. Y.

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Firestone's *Giant Tire Service* puts a Firestone off-the-highway Tire Expert on your job *whenever* you need him. With his completely equipped service truck, he'll handle all your tires from the biggest to the smallest. He'll check your tires regularly for proper inflation and spot potential trouble areas before they develop. Combine Firestone's Giant Tire Service with Firestone off-the-highway tires to bring down tire costs. There's a tubeless or tubed tire built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires, for every construction job. Call your Firestone Dealer or Store about Firestone's Giant Tire Service today.

Rock Grip Excavator® Wide Base Rock Grip Excavator

CONTRACTS AWARDED . . .
continued

Dept. of Airports, City Hall, Los Angeles, Calif. $24,090,383.

Daniel Construction Co., 429 N. Main St., Greenville, S. C. Erect a 2,000,000 sq ft manufacturing plant in Aiken, S. C. Owens-Corning Fiberglas Corp., 601 Madison Ave., Toledo, O. $20,000,000.

Hyde Construction Co., 1804 N. Mill St., Jackson, Miss. Construct a spillway and related works at Keystone Dam on the Arkansas River near Sand Springs, Okla. Corps of Engineers, Box 61, Tulsa, Okla. $16,173,877.

Stolte, Inc., and **Morrison-Knudsen Co.,** 8451 San Leandro St., Oakland, Calif. A joint venture to construct a highway-railroad bridge over the west branch of the Feather River near Oroville, Calif. Dept. of Public Works, 1120 N. St., Sacramento, Calif. $8,738,745.

Al Johnson Construction Co., 608 Foshay Tower, Minneapolis, Minn., and **Peter Kiewit Sons' Co.,** 1024 Omaha National Bank Bldg., Omaha, Neb. A joint venture to construct the upper lock of the St. Anthony Falls Project on the Mississippi River near Minneapolis, Minn. Corps of Engineers, Custom House, St. Paul, Minn. $9,587,002.

Perini Corp., 73 Mt. Wayte Ave., Framingham, Mass. Construct a flood control dam on Everett Reservoir near Manchester, N.H. Corps of Engineers, 424 Trapelo Rd., Waltham, Mass. $8,053,456.

Joseph P. Blitz, Inc., 545 Madison Ave., New York 22, N.Y. Construct the Martin Van Buren and the Forest South Housing Projects at 161 St. in the Bronx, N.Y. New York City Housing Authority, 299 Broadway, New York 7, N.Y. $7,927,000.

Fisher Construction Co., 4711 Greeley St., Houston, Tex., and **Diversified Builders, Inc.,** P.O. Box 877, Paramount, Calif. A joint venture to erect a 12-story federal courthouse and office building in Houston, Tex. General Services Administration, 1114 Commerce St., Dallas, Tex. $7,850,000.

Bearings...

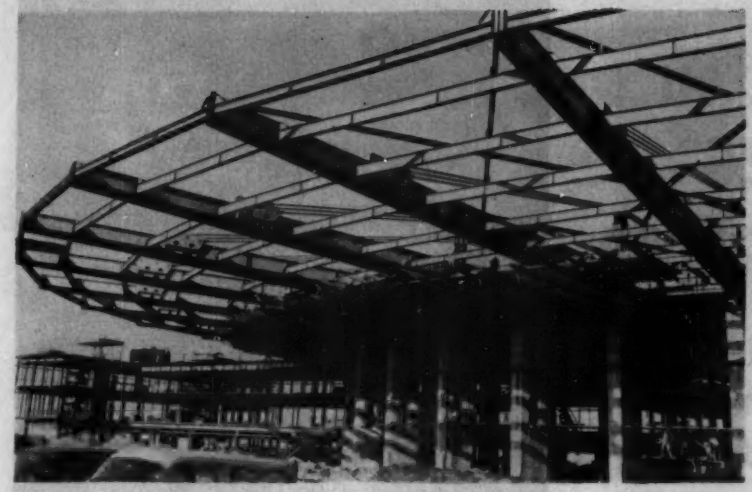
Oil... and How to Save Money

The longer your engines run before need of overhaul—the less your cost of operation. Sinclair Tenol® Motor Oils have earned the reputation not only for giving long bearing life, but also for resisting the formation of harmful carbon deposits. Tenol Oils slash down-time and maintenance costs. Next time management asks how you've cut costs, tell them you've switched to Sinclair Tenol—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.

Sinclair

Sinclair
Tenol® Motor Oils



PICTURE OF THE MONTH

Crew Rides Falsework Elevator

• All falsework for the elliptical concrete roof of the Pan American passenger terminal at Idlewild Airport in New York hangs from the radial girders and purlins that brace the roof frame. It is made up of sections about 10 ft square with manual winches at each corner. Workers ride each section into position, tie it in, and place the forms.

The contractor made up enough falsework for 18 of the 32 wedge-shaped bays of the roof. After the concrete in a bay has cured, the falsework and forms are stripped and moved around to another bay.

The roof will cover an area of more than four acres and shelter six airliners at a time. The canopy portion of the roof cantilevers out 114 ft beyond the piers. General contractor for the $10-million job is Turner Construction Co.

New Remington Model EV-26 CONCRETE VIBRATOR

Now the world's most reliable, simplest-to-use motor-in-head vibrator and only 2⅝" in diameter

Remington research tackled the problem of developing a truly dependable electric motor-in-head concrete vibrator. After months of development and testing, Remington announces the Model EV-26 with exceptional reliability and capacity for fast work in walls, floors, footings and beams. Plug the new Remington Model EV-26 into any 110-volt line. The powerful motor kicks over at 10,000 vpm. The positive, 2-button switch is waterproof and located conveniently near the operator's hand, while a special thermal overload switch protects against motor burnouts on both AC and DC current. The new Model EV-26 is simple to use in one-man operation and comes in 7', 14' or 21' hose lengths with 25' of special heavy-duty cord. It's economical to use because second operator isn't necessary to reposition power source to accommodate limited flexible shaft lengths. Mail coupon for complete specifications on the new Model EV-26 and the complete line of Remington concrete vibrators.

1. Heavy-duty, 6-ply hose with anti-slip finish for safe, easy handling. Wire cord is anchored inside... won't come loose.

2. Welded commutator leads on motor give extra protection during sudden overloads. Thermal-overload protection switch works on AC or DC, automatically resets.

3. Heavy-duty, precision ball and roller bearings on motor, shaft and tip keep internal friction down, stand up to heavy vibration loads.

4. Special Remington eccentric throws out 10,000 vpm with an extra-strong kick.

5. Carburized, alloy-steel head with welded tip for long service. Head diameter less than 2⅝" for work in tight spots.

Carries a six-month guarantee.

Remington

Remington Arms Company, Inc., Bridgeport 2, Conn.
IN CANADA: Remington Arms of Canada Limited
36 Queen Elizabeth Blvd., Toronto 18, Ont.

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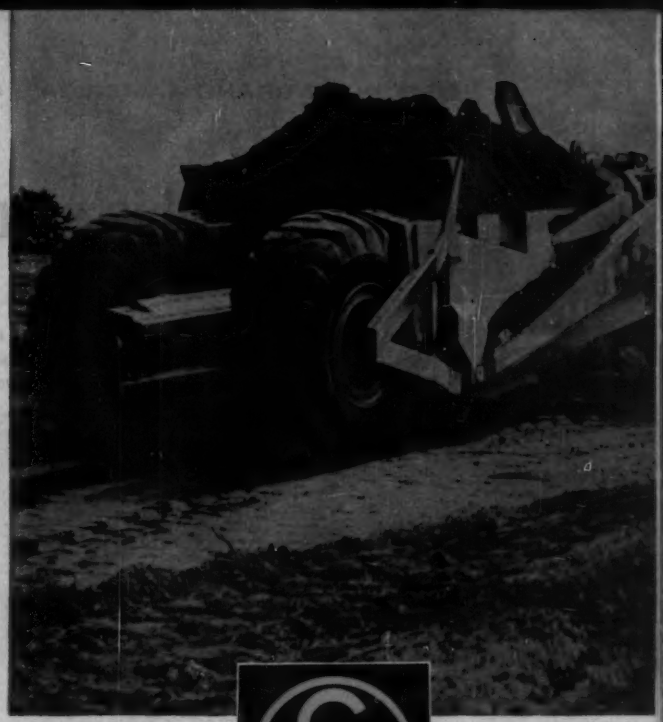
...Your Big 'Extra' With The Curtiss-Wright Line

Those extra yards you pack into each pass . . . the extra cycles per day . . . the extra profit you make from Curtiss-Wright's high output and low operating cost—This is what we mean by the "Yards Ahead" production of the Curtiss-Wright line. Throughout the country, from these scrapers shown working on a road job in the deep south, to the fleets of C-Ws handling tough excavation in the mountains of California, Curtiss-Wright scrapers are giving contractors *production unmatched by any other scraper*. You'll find this "Yards Ahead" production in every C-W model, from the 7 cu. yd. CW-27 to the tremendous CW-226. Check with your distributor on the model to meet your job requirements.



MODEL CWD-221

INTERCHANGEABLE REAR DUMPER

. . . one of the three rear dumpers in the Curtiss-Wright line. Interchangeable with two or three axle scrapers, C-W rear dumpers are available in capacities to 35 tons.

SOUTH BEND DIVISION

CURTISS-WRIGHT CORPORATION

SOUTH BEND, INDIANA

DISTRIBUTED IN CANADA BY CANADIAN CURTISS-WRIGHT, LTD.

USS TIGER BRAND—AMERICA'S NO. 1 WIRE ROPE

607,000 cubic yards of concrete delivered by 'a

SUTTON DAM—One of the largest flood control dams in eastern United States, located on the Elk River about 80 miles from Charleston, W Virginia. Designed and built under the direction of U.S. Army Corps of Engineers, Huntington, West Virginia. Contractors: Joint venture betwe Arundel, Dixon-Hunkin. General Superintendent for contractors, Jay Hay; Project Engineer, Ed. Hahn.

d by "air express" on USS Tiger Brand Tramway Cable

Every 3½ minutes this cableway bucket pours another load of "mud" into the mammoth Sutton Dam near Charleston, West Virginia. They're pouring at the rate of 9,000 cubic yards a week—fast time for one 8-yard bucket. When finished, the dam will contain about 607,000 cubic yards of concrete.

The main "gut" is a Tiger Brand 3-inch Locked Coil Tramway Cable 1,700 feet long. It stretches between one fixed tower and one *moveable* tower so that the bucket can reach any part of the dam. This cable was bought new for the job and from all indications will still be serviceable when the dam is completed. Other Tiger Brand Locked Coil Cables have been used on two or more big dams before replacement was necessary.

All over this project, Tiger Brand Wire Rope is doing a stupendous job. On one of the more critical applications, a 3,920-foot endless rope is used to pull the carriage assembly. Because of the hard wear this particular rope must take, they used a 1⅛" 6 x 30 flattened strand rope made of tough Monitor Improved Plow Steel.

Tiger Brand Wire Rope was also used for the hoist line, button line and take-up line, largely because of its excellent performance on previous dams such as Mt. Morris and Shasta. Mr. Lamar Pearce, Cableway Superintendent, who has had a world of experience on big dams, uses Tiger Brand more than any other make. For more information on wire rope, write American Steel & Wire, Dept. 9351, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

Main Gut—USS Tiger Brand 3-inch Locked Coil Cable with smooth surface for efficient operation. Interlocked construction holds each wire in its proper position.

Lamar Pearce, Cableway Superintendent, who knows from experience that Tiger Brand Wire Rope is safe and dependable.

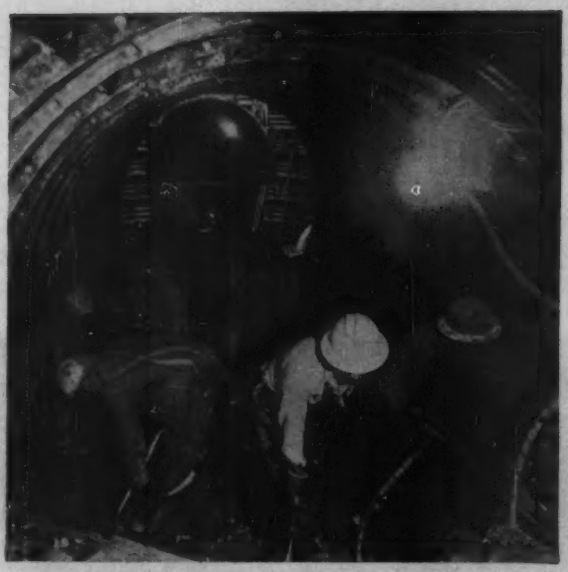
Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete research and manufacturing facilities in the steel industry.
2. It is designed by one of the country's most capable staffs of wire rope engineers. It is serviced by thoroughly experienced field representatives always ready with their assistance.
3. Every type of Tiger Brand Wire Rope is designed for specific applications. *You* get the *right* rope for the job.
4. It is made by *one* company, U.S. Steel, and every step of production from ore to finished product is carefully controlled and supervised to guarantee *one* high standard of quality.
5. Tiger Brand Wire Rope is manufactured by the foremost single wire rope producer in the country.

Concrete delivered by aerial cableway—the cheapest and fastest way to haul materials needed for the dam.

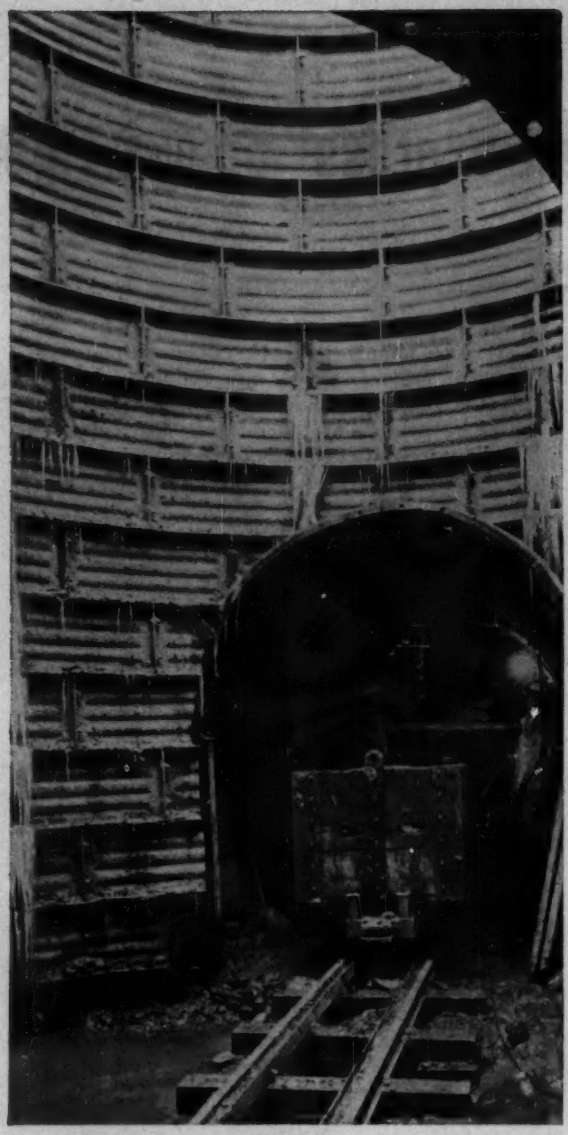
American Steel & Wire
Division of
United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad



Excavation and installation simultaneous

Flanges within reach—all bolting in the open



Complete stability in shaft-tunnel construction

How Continuous Flanged Liner Plates Can Speed Your Tunneling Operation

A major factor in the speedy construction of the Schuylkill Interceptor System of Philadelphia is the use of COMMERCIAL steel liner plates, continuous flanged with solid corners. The extreme ease by which these plates can be installed is due to simplified flange-to-flange bolting—all in the open.

Four thousand eight hundred feet long and averaging thirty-five feet below the surface, one of these tunnels passes under railway lines and heavy city traffic... demanding roof support of maximum strength. In addition, unstable and unpredictable ground conditions makes tunneling difficult and working conditions hazardous.

Since the COMMERCIAL steel tunnel support system was selected, the strength, safety, speed and ease of erection required for this complex project is now assured. Liner plates with precision-matched bolt holes provide quicker, more simplified erection and are of sufficient thickness to furnish the necessary shoring strength to insure uninterrupted lines of travel directly above.

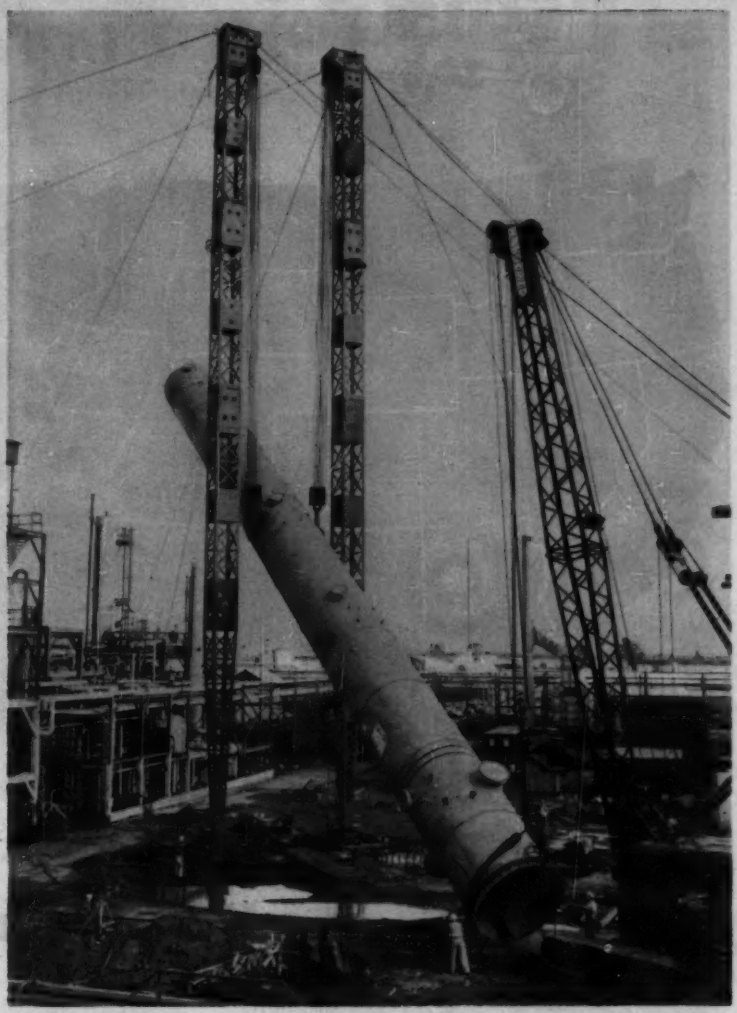
COMMERCIAL steel support systems are custom made to fit tunnels or shafts regardless of size or ground condition. For more complete details on how these systems can simplify and speed up your vertical shaft, surface or sub-surface tunnel project—help make it safer—send today for your copy of Catalog 300-C1. Address: Commercial Shearing & Stamping Company, Dept. B-49, Youngstown 1, Ohio.

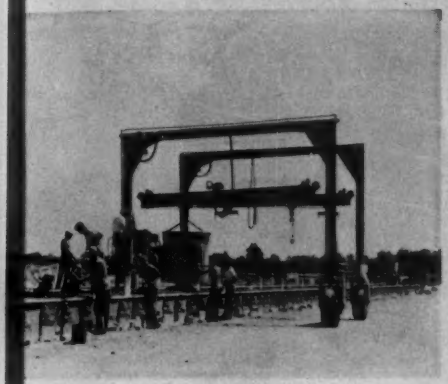
COMMERCIAL
shearing & stamping

Construction News in Pictures . . .

Tall and Heavy

A pair of gin poles and a Manitowoc crawler crane erect the first of two 200-ton distillation towers for a $2-million propylene plant at the Sun Oil Company's refinery at Marcus Hook, Pa. The 145-ft-high unit was fabricated by the Sun Shipbuilding & Dry Dock Company and installed by Catalytic Construction Co. of Philadelphia.





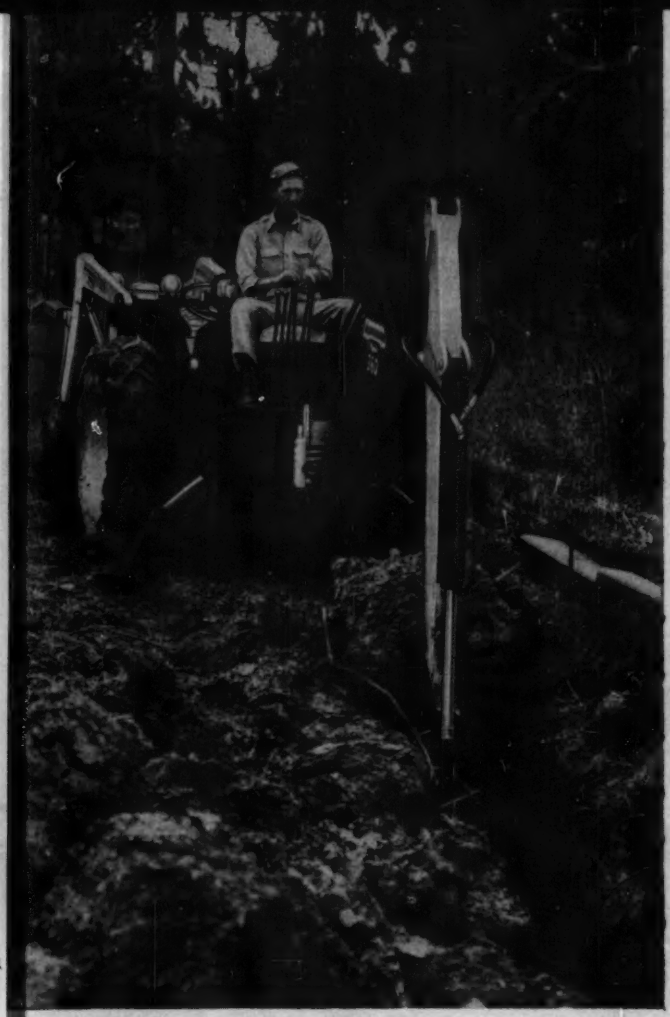
Prestressed Stadium

Travelift handles a 1½-yd Insley bucket to pour concrete in a casting bed 360 ft long. Shute Concrete Products, Inc., of Richmond, Ind., is producing 3,300 prestressed concrete channel beams for seats and walkways of a $5-million football stadium at Indiana University. General contractor is Huber, Hunt & Nichols, Inc., of Indianapolis.

Space Age Job

"They seem to be more steel than concrete," is the comment of project manager Robert L. Landau about the reinforced concrete launching pads under construction near Reardon, Wash., for an Atlas missile base. Bethlehem Steel's Seattle plant will supply 500 tons of rebars. Joint venture contractor is MacDonald-Patti-Scott-Leavell.

continued on page 64



Wading through muck in the dead of winter, Deviney Construction Co., Jackson, Miss., dug 5,000 ft of trench for underground telephone cable. The 460 Utility is equipped with heavy-duty International Pippin backhoe and loader. Backhoe trenches to grade, as deep as 12½ ft.

Backhoe-loader combination: International Wagner

International 460 does own backfilling, and handles a wide variety of heavy-duty materials-handling jobs with front end loader. New Fast Reverser Unit speeds shuttle-type operations with six speeds, coming or going.

6-cylinder brawn for the BIG BITE!

INTERNATIONAL® 460 UTILITY TRACTOR

Try an International 460 Utility tractor on your tough trenching jobs and learn quickly how this husky, smooth-flowing power on rubber can earn more for you.

Bite fast and clean in tough-to-dig materials with a big backhoe bucket. More than 5,000 pounds of built-in operating weight—3,185 on the rear wheels alone—assures the brawn you need for top production, and less downtime.

You'll cut operating costs with the Multi-Range 61-hp* engine which delivers remarkable fuel economy at every load-matching throttle setting from 600 to 1,800 rpm. Six-cylinder smoothness—quiet and virtually vibration-free—increases output by reducing operator fatigue.

CASH BONUS for Early Traders! Right now, your IH Dealer will pay you interest, at the rate of 6% for a specified time, on the value of your trade-in and/or cash payment toward the purchase of new International utility tractors and equipment! Cash bonus paid *immediately.* Protect yourself against possible price increase . . . assure delivery in time for spring jobs—*See your IH Dealer NOW!*

**Maximum flywheel hp*

See your INTERNATIONAL® HARVESTER dealer

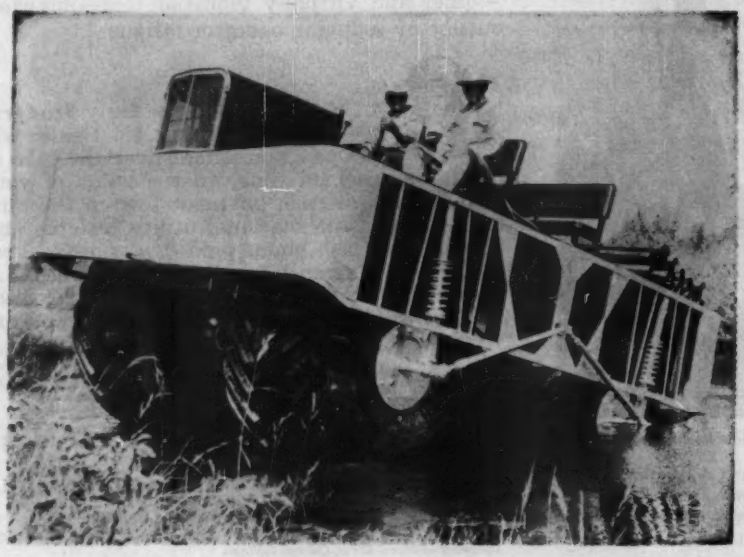
International Harvester Products pay for themselves in use—Farm Tractors and Equipment . . . Twine . . . Commercial Wheel Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois

Drives Long Piles Fast

A 35-ton Lorain crane mounting a McKiernan-Terry hammer drives 120-ft piles to depths of more than 100 ft for the foundation of an addition to a Lake Superior District Power Co. plant at Ashland, Wis. The rig is driving a total of 115 piles at an average rate of about one an hour. Contractor is Bridge Builders, Inc., of Superior, Wis.

Team of Diggers

An Ottawa backhoe mounted on a Trojan tractor shovel lowers a 4-ft section of 18-in. concrete pipe into a trench at a housing project near Whitman, Mass. The Link-Belt backhoe handles trench excavation. Thomas F. Lynch, Inc., is installing the storm and sanitary systems for the project. Ward & Johnson, Inc., is the general contractor.



Tires Like Pontoons

Marsh buggy that weighs 4,000 lb and can carry a load equal to its weight churns through a Louisiana swamp on low-flotation Goodyear Terra-Tires that are more than 5 ft high and 42 in wide. Rig was designed and built by Crain Bros. of Grand Chenier, La., to be used primarily by construction and oil drilling crews for light hauling.

65-ton MC-760 spots 84-ft. long pipe with 78-in. diameter with pin-point accuracy. Only ¼-in. tolerance is permitted for welding. Moto-Crane moves to new location every hour.

8 LORAINS LAY 7 MILES OF TRIPLE CONDUIT FOR $7½ MILLION ST. LOUIS WATER LINE

St. Louis will get 240 million gallons of Mississippi water a day—two-thirds of its needs—through this new water line running south from Chain of Rocks Station. General Contractor for the job is Fred Weber Construction Company of St. Louis —a nine-time Lorain owner.

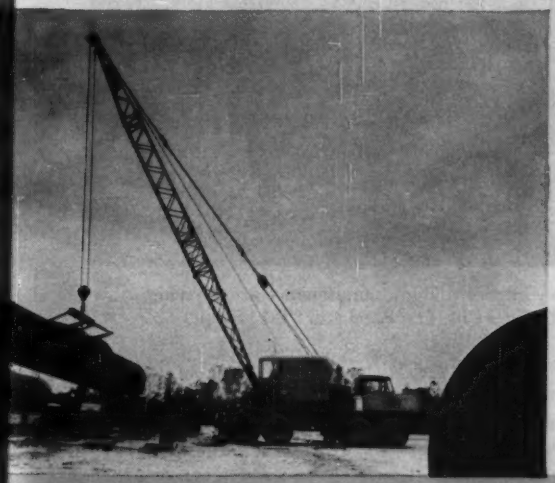
Loading 84-ft. sections every 15 minutes. At the welding yard, Moto-Cranes position 78-in. diameter pipe for cleaning and welding. Lorain's precision boom lowering, "Joy-Stick" air controls and fast-acting "Power-Set" outriggers make this output possible.

Pipeline advances 750-ft. a day. William Brothers Construction Co. of Tulsa is in charge of pipe laying. They use Lorain Moto-Cranes to position three lines onto large concrete bed. Twenty-nine Lorains have paid off for William Brothers.

There are many more modern Lorain advantages that can help you on your jobs. See your Lorain distributor for all the facts.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

70% increase in production at the cleaning and welding yard is credited to Lorain "Power-Set" Outriggers. Less than one minute to set—versus 45 to 60 minutes for conventional outriggers — makes the difference. There are 3 Lorains with "Power-Set" Outriggers on this project.

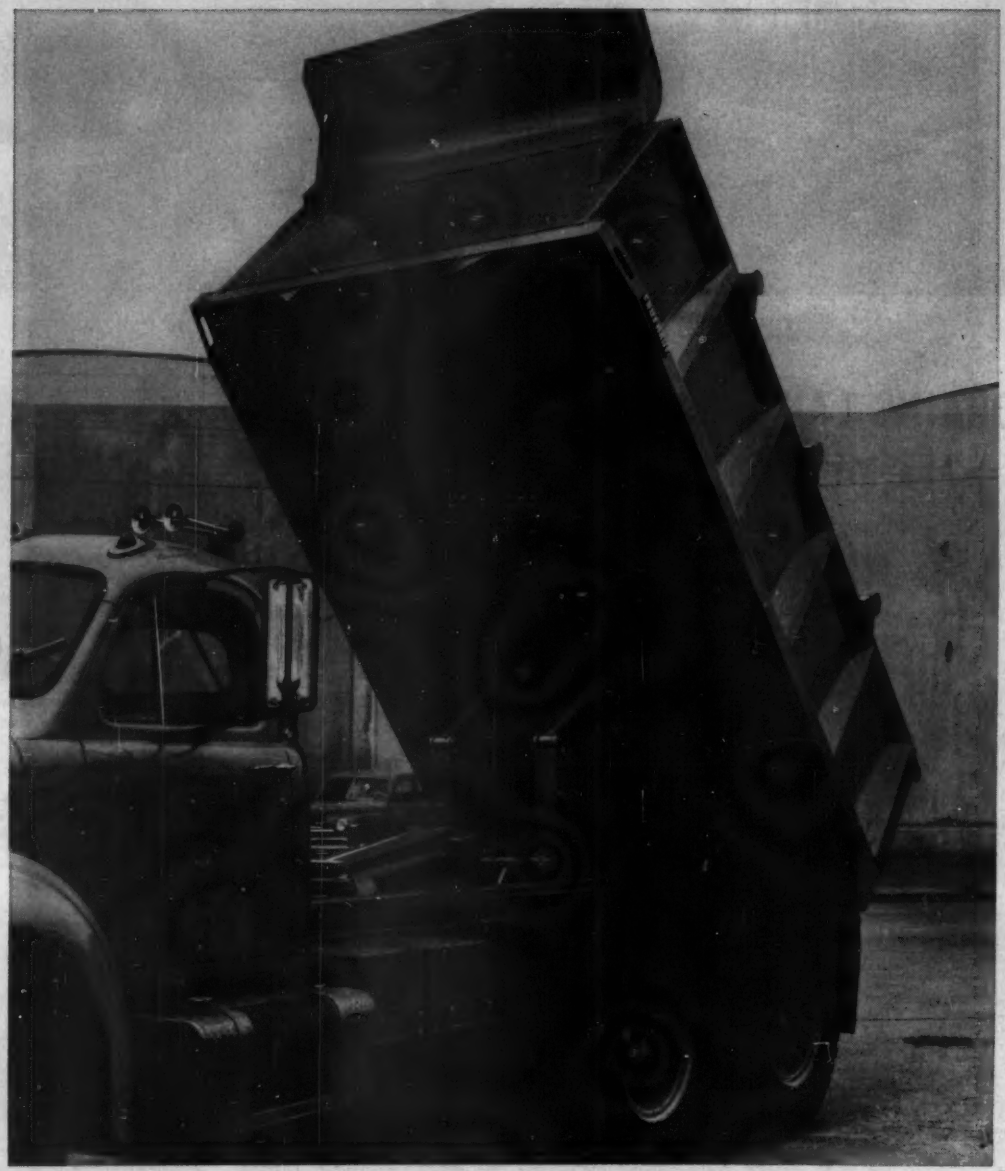


35-ton MC-530W with 70-ft. boom and clamps eases 42-ft. pipe sections onto rack in welding yard where they are welded into 84-ft. lengths. These are loaded out at the rate of 32 a day.

60-ton crawler-mounted Lorain positions three pipe lines to be lined with concrete and encased in a 21-ft. 6-in. by 7-ft. 6-in. concrete envelope. One of two crawler-mounted Lorains on this project, this heavy-duty machine is also used for dragline work.

LORAIN. ON THE MOVE

USS COR-TEN and "T-1" Steels cut truck we



Weight reduction of 1,020 pounds, resistance to heavy impact and low maintenance are the main reasons why these dump truck bodies were built with USS COR-TEN Steel and "T-1" Steel.

ck weight 1,020 pounds—boost payload

These 9-yard trucks used by the Northwest Construction Co., Seattle, double as cement batch trucks and earth movers. For this reason, they built the sides and ends from USS COR-TEN High-Strength Low-Alloy Steel for strength plus atmospheric corrosion resistance. They put 3/16" plates of "T-1" Steel in the bottoms to take the battering from rock and shale. This combination produced a truck body that weighs 1,020 pounds less, hauls *more* payload, lasts *longer* and needs *less* maintenance.

Mr. Homer Baer, Shop Maintenance Superintendent at Northwest Construction, says, "I'm not a steel man, but when metal takes the beating that this stuff does, it's a superior product." He was referring to the USS COR-TEN Steel in the sides and tail gate and the "T-1" Steel in the floor.

"With the old trucks, denting and cracking of dump beds caused by dropping rocks used to be a major problem," says Mr. Baer. "Since installing 'T-1' Constructional Alloy Steel, we haven't had a single incident of cracking or denting. That stuff has the highest impact resistance of any steel I've ever seen."

Northwest Construction has 15 of these rugged trucks in service. The bodies are fabricated by Fruehauf Trailer Co., Seattle, and the metal forming is done by Capitol Industries.

Good fabricating properties. All USS High-Strength Steels in the 50,000 psi yield point range can be readily formed and welded. These include USS COR-TEN, MAN-TEN and TRI-TEN brands. USS "T-1" Constructional Alloy Steel is also weldable and workable and has a minimum yield strength of 100,000 psi. It provides extra high strength and great resistance to impact abrasion. Used together, these steels offer a perfect combination for construction equipment. For more information, write to any district office of United States Steel or Room 2801, 525 William Penn Place, Pittsburgh 30, Penna.

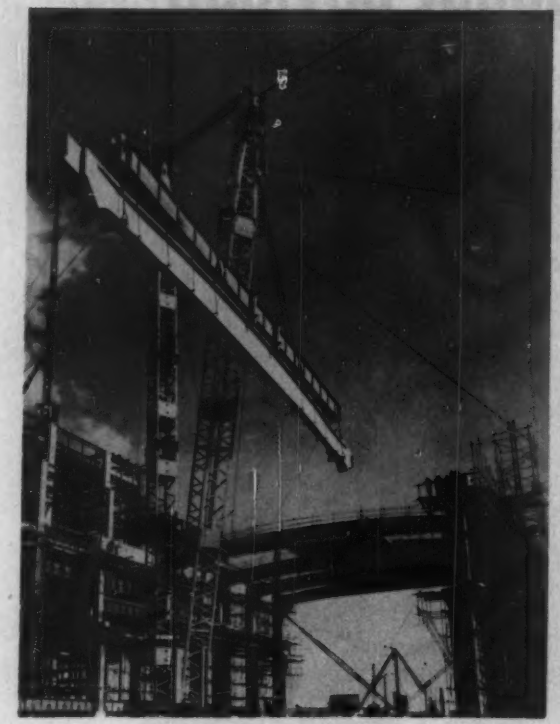
USS, COR-TEN, MAN-TEN, TRI-TEN and "T-1" are registered trademarks

USS

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

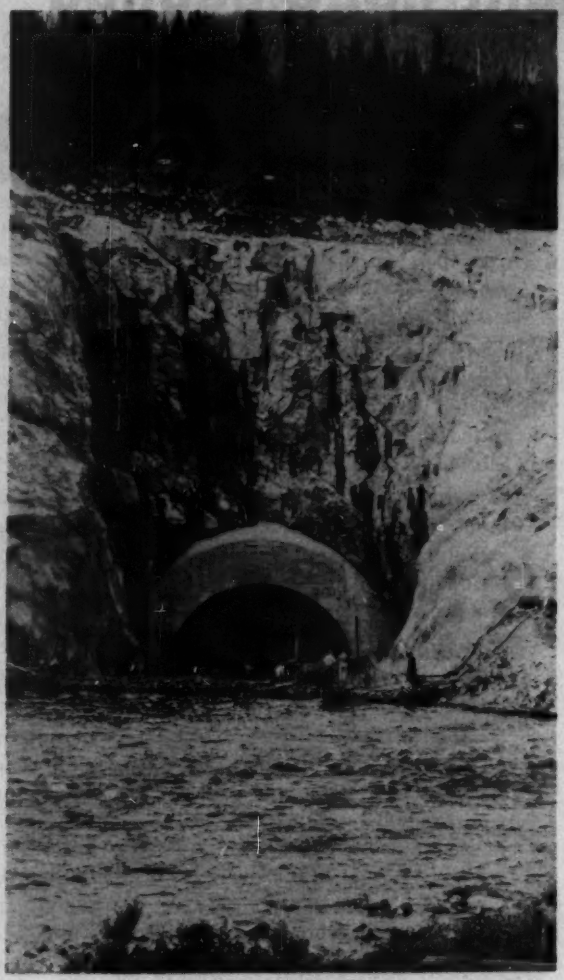
United States Steel

Construction 'Round the World . . .



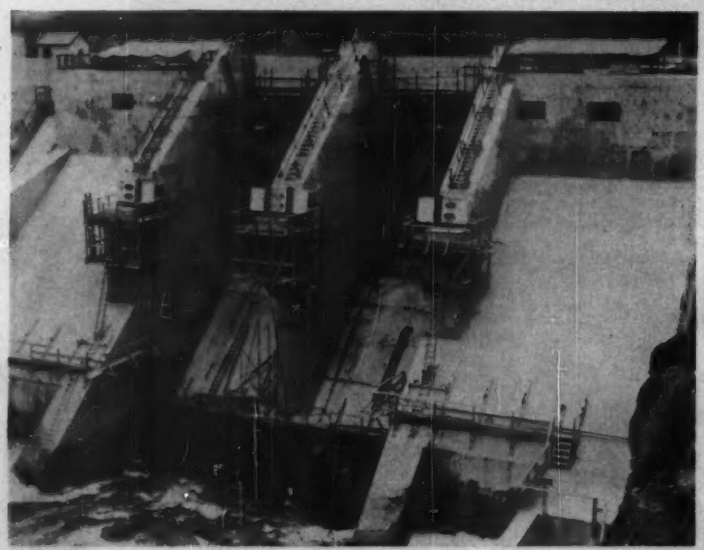
In Great Britain

Giant guy derrick with 180-ft mast and 162-ft boom hoists a 55-ton prestressed concrete girder into place during the construction of a powerhouse. Derrick, with 78-ton lifting capacity, has been walked 40 ft from bay to bay. General contractors are John Morgan, Ltd., Cardiff. John Brown Constructors, Ltd., operate the derrick.



In Canada

Workmen prepare to blast rock plug that blocks flow of water through discharge tunnel of Alcan's $150-million hydroelectric project at Chute des Passes, Que. From the powerhouse, water passes through 9,000-ft tunnel, emptying into Peribonka River. The entire project is a joint venture of Perini-McNamara-Quemont.



In New Zealand

Spillway at Waipapa hydroelectric project is ready for precision installation of 24-ton gates. Frames for the 25x31-ft gates are concreted in place in spillway structure across the Waikato River. When opened, each gate will be able to pass 15,000 cu ft of water a sec. Project is scheduled to produce first power in 1961. Capacity is 51,000 kw.

CATERPILLAR'S
PROGRESS REPORT
1959

NEVER before, in *one* year, has *one* manufacturer introduced a more impressive array of new heavy-duty earthmoving machines and major earthmoving developments than Caterpillar in 1959. All these new machines and developments, the dramatic result of Caterpillar's broad research and development program, have *one* common denominator: they pay off with faster, lower cost production than the earthmoving field has ever seen. They help you compete successfully in the most competitive construction market in history.

On the following pages you'll see all these machines and some of the developments. For the complete picture, see your Caterpillar dealer. Whatever your need, you'll find he has the *most productive* machine for it in his complete, modern, heavy-duty equipment line-up.

What about 1960? Caterpillar's multimillion-dollar research and development effort is a *continuing* program. That means you can count on *continuing* major equipment news from Caterpillar during the coming year. Keep your eye on Caterpillar in 1960!

Here they are— CATERPILLAR'S NEW M

D9 Series E

Now the "King of the Crawlers" is better than ever with new capacity for higher, faster, lower-cost production on any big-tractor job. Here are some reasons why:

NEW UNDERCARRIAGE. Here's the "newest look" in this take-charge giant. Its undercarriage is more massive, more rugged than ever. And major improvements in all track components add hundreds of hours of life to running gear—hours that mean more time even on the toughest job.

STRONGER TRACK COMPONENTS. Bigger, heavier track links, shoes, pins and bushings give longer trouble-free service in roughest going. Increased link pitch from 9" to 10¼" means added size and strength in all track components. New deep hardening steel gives up to 40% longer life to shoes, links and rollers.

NEW 335 HP (flywheel)—268 HP (drawbar). More powerful than ever, the D9's Turbocharged Engine has the capacity to handle bigger loads faster, with even greater dependability and economy. A new, compact Turbocharger packs more air by weight into the engine and improves fuel-burning efficiency.

NEW EQUALIZER BAR. This important improvement in the D9 helps increase production, particularly on sidehill applications where the rocking action of the bar shifts more weight to the uphill track. Result: better tractor stability and increased operator confidence.

D8 Series H

Pacesetter in its tractor class, the new D8 Series H incorporates dramatic new engineering advances. Some are described here. For complete details, see your Caterpillar Dealer.

NEW POWER. The horsepower of the new D8 is up from 191 to 235 at the flywheel, from 155 to 185 at the drawbar. In addition, engine torque rise now is 20%, an increase of one-third. Over-all engine performance has been greatly improved by the addition of a Turbocharger.

NEW DIMENSIONS AND WEIGHT. The new D8 is heavier—it weighs 47,000 lb., over 2 tons more. It has 84" track gauge, 5,505 square inches of track on the ground with standard 22" track shoes. The new D8 has 19⅞" ground clearance—50% more than ever before—and the most in its class.

NEW LIFETIME LUBRICATED ROLLERS AND IDLERS. Rollers and idlers are lubricated at the factory and will require no further lubrication until rebuilding. Special metal floating-ring seals keep lubricant in, dirt out, for lifetime lubrication. Proved by over 5 years of testing.

NEW DRY-TYPE AIR CLEANER. Most efficient air cleaner ever developed. Removes at least 99.8% of all dirt from intake air during *every* service hour. Can be serviced in five minutes. Cuts maintenance time by as much as 75%. Efficient at all engine speeds and operating conditions.

EW MACHINES AND DEVELOPMENTS IN '59!

CAT DW20 and DW21 SERIES G TRACTORS

Now 345 HP for faster cycles—plus new high-capacity LOWBOWL Scrapers for bigger loads!

New horsepower, new rimpull, new speeds, new scraper ratings and new stronger structures—that sums up the impressive list of improvements made in these big new Caterpillar rigs. Compared with the models replaced, the new 345 HP (max. ou[illegible]) four-wheel DW20 and two-wheel DW21 Series G Tr[illegible]ors deliver 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Compared with previous models, the new LOWBOWL Scrapers (No. 456 and No. 470 Series B) have 8% greater capacity. Their new ratings: 19.5 cu. yd. struck; 27 cu. yd. heaped. Also, the new No. 482 Scraper for use with the DW20 has 24 cu. yd. struck capacity, 34 cu. yd. heaped.

To handle this increased HP and increased capacity, both tractors and scrapers have been improved in design and structure. The tractors, for example, have stronger final drive gears and improved transmission shifter forks. The scrapers have stronger bowls, draft frames and aprons. All these and other improvements result in better service life, less maintenance and cheaper dirt. Geared for today's highly competitive market, these high-capacity rigs meet your needs for moving more dirt at lower cost than ever!

CAT D7 SERIES D TRACTOR

Packed with more power and more features to deliver even more production at lower cost!

More productive ability and greater operating economy —that's the result of advances in the new D7 Series D to make it an even better investment than the efficient machine it replaced.

Here are some of the key features that put the new D7 way out front in its class. A new Turbocharged Caterpillar Diesel Engine develops 140 flywheel HP, 112 drawbar. Improved torque characteristics increase its lugging ability [illegible]%. The D7 also features a new dry-type air cleaner, new lifetime lubricated rollers, new lubrication system for transmission, new stronger final drive gears and optional in-seat starting. With all these and other new advances, certain time-tested features have been retained. To mention one, there's the exclusive oil clutch, which delivers 2,000 hours of service without adjustment.

For day-in, day-out hard work, no other machine of comparable size can match the new D7 Series D. It is way out in front of all others in its class!

Here they are— CATERPILLAR'S NEW M

POWER SHIFT TRANSMISSION

for D8 and D9 Tractors

On-the-go shifts under full load in a split second. Changes speed, reverses direction with finger-tip control lever—and no clutching!

This rugged new transmission, with an exclusive new design, provides production highs never before possible with a track-type tractor. Here's why: 1. It combines for the *first* time the flexibility and anti-stall features of torque converter with the operating snap of direct drive. And because of its direct drive characteristics, it is more efficient than other power shift designs. 2. With one control lever and no clutching, it reverses direction . . . changes speed . . . smoothly . . . under full load . . . in a fraction of a second.

Power shift control is mounted to the operator's left. One selector lever (black knob) eliminates gearshift, forward-reverse and flywheel clutch levers. The safety lever (red knob) prevents accidental engagement. The selector lever moves in a "U" path to various positions. Shifting is so easy the operator just naturally gets more work out of the tractor even on the toughest jobs.

One ton of ruggedness, Cat power shift transmission stands up under the heaviest earthmoving duty. See it demonstrated on D8 and D9 Tractors.

EW MACHINES AND DEVELOPMENTS IN '59!

CAT DW20 and DW21 SERIES G TRACTORS

Now 345 HP for faster cycles—plus new high-capacity LOWBOWL Scrapers for bigger loads!

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SYNCHROTOUCH TRANSMISSION CONTROL

for DW20 and DW21 Tractors

An advanced new way to shift gears easier and faster. Operator simply dials desired gear for automatic, split-second, touch-and-go response!

This remarkable Caterpillar advance combines economical direct drive transmission with the easiest, fastest shifting possible. An optional arrangement for DW20 and DW21 Tractors, SynchroTouch Transmission Control permits effortless shifting of transmission gears by means of a gear selector placed near the operator's right hand.

To shift up or down, the operator simply moves a selector switch to the desired gear. In less than a second, it is engaged. The standard foot clutch is retained, but is used only when starting from a standstill.

Fully tested on the job, Caterpillar SynchroTouch Transmission Control gives you these important benefits:

1. Faster shifting—for faster cycles and more payloads per hour.
2. A big reduction in operator fatigue—for more daily production.
3. Economical direct drive transmission—uses standard DW20 and DW21 transmission and clutch components.
4. No special maintenance required.

See the DW20 and DW21 in action with this great new optional control!

Here they are— CATERPILLAR'S NEW

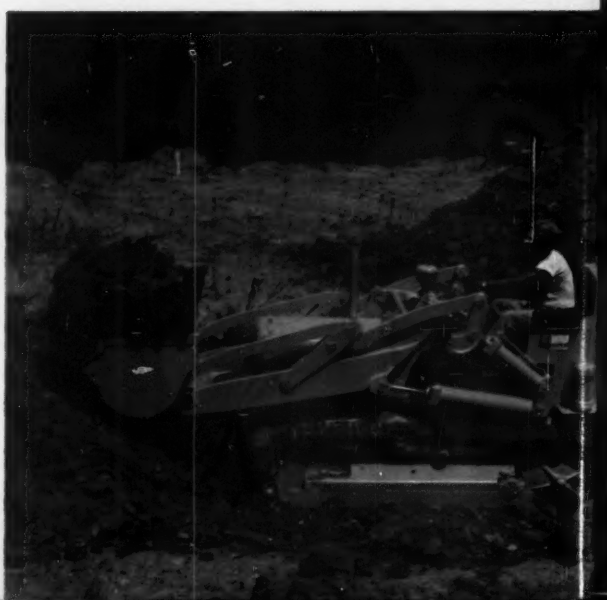
CAT No. 933 SERIES F TRAXCAVATOR

New power, new capacity, more features and new ruggedness increase output as much as 22%!

From every standpoint, the new No. 933 Series F is a bigger producer than the Series E model. You can count on it for more work cycles per hour, more yards production per day, easier operation and greater profits per job.

The Series F has many new features. Here are just a few. It has a new 1⅛ cu. yd. bucket, longer bucket reach and greater digging depth. Its new 52 HP Cat Engine is shorter, more compact with new engine balancers for smoother operation. It provides new operator comfort with convenient grouping of easy-operating controls and instruments, ample leg room and new comfortable seat. Its new power train, with 4 forward speeds (1.51 to 5.48 MPH) and new 3.67 MPH reverse boost production. And the time-proved, dependable oil clutch is standard.

Match the No. 933 against anything in its size. You'll be convinced: here's the most excavator-loader for your money!



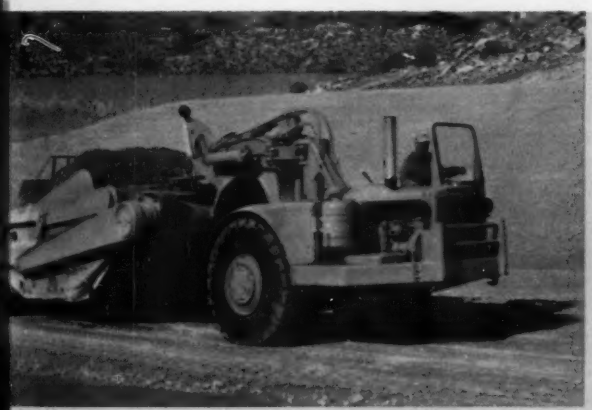
EW MACHINES AND DEVELOPMENTS IN '59!

CAT DW20 and DW21 SERIES G TRACTORS

Now 345 HP for faster cycles—plus new high-capacity LOWBOWL Scrapers for bigger loads!

New horsepower, new rimpull, new speeds, new scraper ratings and new stronger structures—that sums up the impressive list of improvements made in these big new Caterpillar rigs. Compared with the models replaced, the new 345 HP (max. output) four-wheel DW20 and two-wheel DW21 Series G Tractors deliver 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Compared with previous models, the new LOWBOWL Scrapers (No. 456 and No. 470 Series B) have 8% greater capacity. Their new ratings: 19.5 cu. yd. struck; 27 cu. yd. heaped. Also, the new No. 482 Scraper for use with the DW20 has 24 cu. yd. struck capacity, 34 cu. yd. heaped.

To handle this increased HP and increased capacity, both tractors and scrapers have been improved in design and structure. The tractors, for example, have stronger final drive gears and improved transmission shifter forks. The scrapers have stronger bowls, draft frames and aprons. All these and other improvements result in better service life, less maintenance and cheaper dirt. Geared for today's highly competitive market, these high-capacity rigs meet your needs for moving more dirt at lower cost than ever!



The "ALL NEW" No. 619-No. 442 and the NEW SERIES F DW15-No. 428

Select the tractor-scraper most suitable for your normal working conditions—the two-wheel No. 619 or the four-wheel DW15!

The new No. 619-No. 442 shown here is the first two-wheel rig with advanced design and performance features for any job. Its Turbocharged Cat Engine provides 225 HP and high torque rise, ideal for lugging under load and fast acceleration. Its LOWBOWL Scraper handles 14 cu. yd. struck, 18 cu. yd. heaped. It has a 30.2 MPH operating speed, plus ground-hugging roadability never before found in a two-wheel tractor of comparable size. In every way, it is a versatile "all job" rig.

Design improvements assure greater productivity than ever in the well-known four-wheel DW15-No. 428. New strength has been added for increased service life in bevel gear and pinion, differential and front wheel spindles. Along with these and other advances, this new Series F unit retains features that made it top performer in its class. It provides 200 HP (max. output) and high torque rise. Its LOWBOWL Scraper handles 13 cu. yd. struck, 18 cu. yd. heaped. The DW15 is also a versatile unit. It can be unhitched from the No. 428 and used to haul other units, among them the Athey PR15 Rear Dump Trailer.

BIG No. 14 TURBOCHARGED MOTOR GRADER

Most versatile BIG grader ever developed for high capacity both on power and control applications!

The first and only Turbocharged motor grader, the No. 14 packs 150 HP. Operates at the highest practical working speeds with either a 12′ or 14′ moldboard. Weighs in the 30,000-lb. class. And with all this power, speed and heft, it has the extra strength to deliver the high availability for which Cat Motor Graders are famous.

Big features include ample throat clearance between moldboard and circle for greater loads; the exclusive Cat-built oil clutch for longer life; the new dry-type air cleaner for greater efficiency; and big 14:00-24 tubeless tires all around.

You can put this versatile unit to work *profitably* on many different applications, such as:

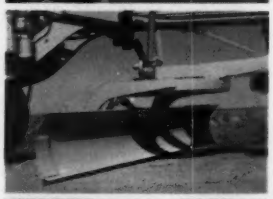
—power applications like heavy grading, heavy ditching, rough grading and bank sloping.

—control applications like light spreading, surface maintenance, fine grading and light blading.

Because of this versatility, you don't have to pick "spots" for it. The No. 14 pays off in a big way on any big job. Name the date—your Caterpillar Dealer will demonstrate!

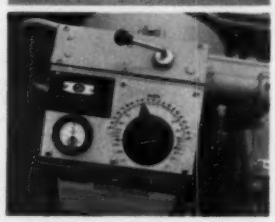
Turbocharged Engine

New 6-cylinder Turbocharged Cat-built Diesel develops 150 HP, with unequaled lugging ability—an 18% torque rise. Only motor grader in its class with "own make" engine. A dry-type air cleaner removes 99.8% of dirt from air during every service hour.



Heavy-Duty Circle & Moldboard

New design provides big load-carrying capacity. Circle and 12′ x 27″ x ⅞″ moldboard are the strongest in the big motor grader class. A 14′ moldboard is optional. Exclusive, new Cat mechanical blade controls provide precise, fast blade adjustment and positive hold.



Preco Automatic Blade Control

Optional on the No. 14. Another exclusive for Caterpillar Graders! Operator selects desired slope on dial. Transistorized for freedom from maintenance and adjustment, the unit automatically maintains blade slope within ⅛″ in 10′. The Preco control increases operator efficiency on a wide range of applications.

Caterpillar Tractor Co., General Offices, Peoria, Ill.; San Francisco, Calif., U.S.A.

CATERPILLAR

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DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

BORN OF RESEARCH
PROVED IN THE FIELD

Lehigh Mortar Cement "... helps the masons do a good job"

Architect: Hopkins & Burton, Baltimore, Md.
Contractor: The George Hyman Construction Co., Washington, D.C.
Dealer: Hudson Supply & Equipment Co., Washington, D.C.

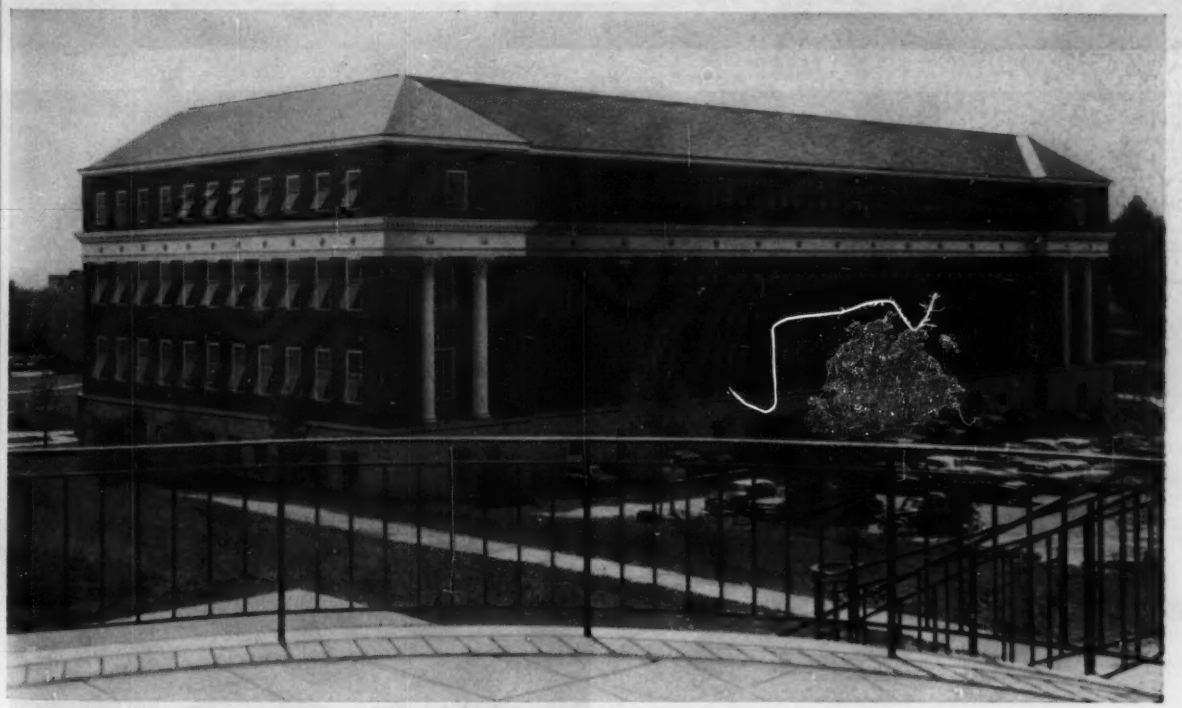
• The Theodore R. McKeldin Library is the latest of several large structures built on the University of Maryland campus by The George Hyman Construction Company. It clearly shows the results of good workmanship and good materials.

In commenting on the beautiful masonry walls of this library, Mr. J. A. Kopson, construction veteran of 50 years and superintendent on this job, had this to say about Lehigh Mortar Cement, "It has excellent strength, good color and its workability helps the masons do a good job."

This is typical of the comments made by users of Lehigh Mortar Cement the country over. So whether your next job is large or small, traditional or modern, try Lehigh Mortar Cement and see for yourself how it can help you build clean, strong, weather-tight walls. Lehigh Portland Cement Company, Allentown, Pa.

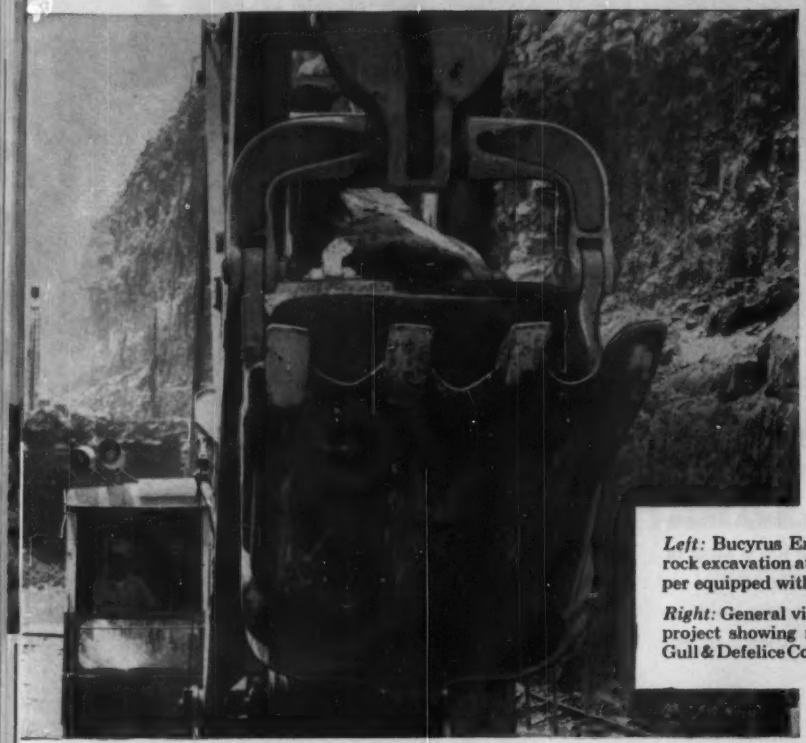
- LEHIGH MORTAR CEMENT
- LEHIGH AIR-ENTRAINING CEMENT
- LEHIGH EARLY STRENGTH CEMENT
- LEHIGH PORTLAND CEMENT

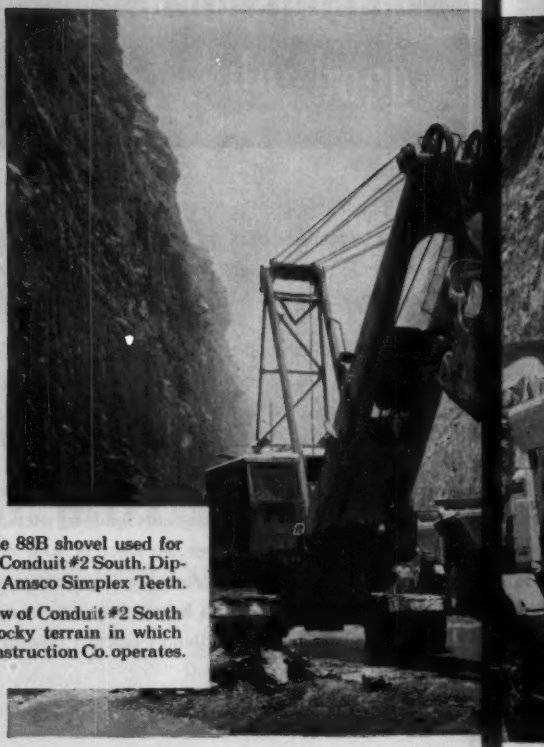
LEHIGH CEMENTS



Rear view of Theodore R. McKeldin Library. The building has eight stories and basement. It is approximately 118 x 243 feet.

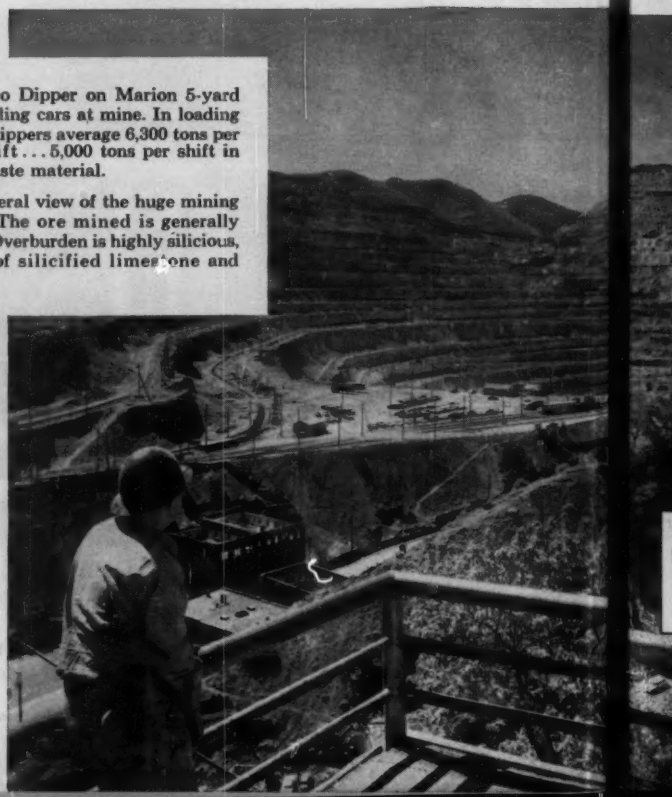
How AMSCO helps you MOV





Left: Bucyrus Erie 88B shovel used for rock excavation at Conduit #2 South. Dipper equipped with Amsco Simplex Teeth.

Right: General view of Conduit #2 South project showing rocky terrain in which Gull & Defelice Construction Co. operates.



Left: Amsco Dipper on Marion 5-yard shovel, loading cars at mine. In loading ore, these dippers average 6,300 tons per 8-hour shift . . . 5,000 tons per shift in working waste material.

Right: General view of the huge mining operation. The ore mined is generally porphyry. Overburden is highly silicious, composed of silicified limestone and quartzite.

MORE TONS PER DOLLAR

Read these user reports on how AMSCO Dippers and Teeth perform in rugged digging service

ON THE NIAGARA POWER PROJECT

40,000 YARDS OF ROCK HANDLED BEFORE AMSCO 2-PART TEETH NEED REPLACING

Gull & Defelice Construction Co. is working on Section 3 of the powerhouse conduit project – excavating 140 feet deep, almost entirely in rock. All five power shovel dippers on the job are now equipped with Amsco Simplex 2-Part Reversible Teeth.

These dippers work *16 hours a day, 6 days a week for 2 weeks–handle approximately 40,000 yards of rock*–before tooth replacement is required.

Says Mike Cazzolla, Equipment Superintendent, in talking about the Amsco teeth: "They're built rugged and take a lot of punishment from the rock. We get longer wear out of them because we can turn them over." He's referring, of course, to the reversible tip feature.

John Cazzolla, Master Mechanic, adds the important fact that *they can replace these teeth in ten minutes with no trouble.* This feature, together with the longer wear, means important savings in downtime.

AT ONE OF WORLD'S LARGEST COPPER MINES

THEY USE AMSCO DIPPERS ...FOR HIGH-SHOCK, HIGHLY ABRASIVE DIGGING

This huge copper mine operates the largest collection of big power shovels (5 yards and up) in the world. For this rugged service they use Amsco dippers to strip off extremely abrasive overburden ... handle waste material ... and load copper ore. These are cast manganese steel dippers – built for toughness, high abrasion resistance and long service life.

For rugged digging anywhere

... wherever high impact and abrasion are problems, you'll "move more tons per dollar" with Amsco Manganese Steel Dippers and Simplex 2-Part Reversible Teeth. See your power shovel equipment dealer for sizes and types available. Or write us direct for technical bulletins on Amsco Dippers and Simplex 2-Part Teeth.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other Plants In: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

B.F.Goodrich

General Contractor: Merritt-Chapman & Scott Corp.

Rubber sends mountains of rocks to help bottle up a river

B.F.Goodrich improvements in rubber brought extra savings

MOUNTAINS of rocks, gravel and sand carried on those conveyor belts are made into concrete for a tremendous dam across the Colorado River. Engineers figure it will take *10 million* tons of this stuff to build a towering 700 foot wall stretching 1500 feet across the canyon. But contractors can't afford to have any delays caused by belts breaking down—thousands of men would be made idle.

B.F.Goodrich men, working with the contractors, suggested they use conveyor belts made with Nyfil fabric. These belts use nylon for cross threads in the fabric. They were developed by B.F.Goodrich to make the belts so strong they can stand the wear and tear that caused other belts to break down. And, most important, they cost no more than other belts.

These B.F.Goodrich Nyfil belts have been working on the Glen Canyon Dam project for two years now—16 hours a day, 5 days a week. There hasn't been a single breakdown and these belts are expected to give the same kind of service during the entire 5 or 6 years it will take to build the dam.

Part of the B.F.Goodrich service on big construction jobs like this is a special maintenance crew on the site. They give on-the-spot service to the belts, hose and tires so contractors lose as little time as possible keeping equipment on the job.

For complete information on the conveyor belt described here and all the other rubber products B.F.Goodrich makes for industry, call your B.F. Goodrich distributor. *B.F.Goodrich Industrial Products Company, Department M-737, Akron 18, Ohio.*

B.F.Goodrich *industrial rubber products*

Construction Methods AND EQUIPMENT

DECEMBER, 1959

VOLUME 41 • NUMBER 12

HENRY T. PEREZ, Editor

Featherbedding

ONE OF THE PRIME POINTS of contention in the steel strike is the matter of labor featherbedding. The same issue is sure to be a big factor in forthcoming negotiations between the railroad companies and their operating unions. And the featherbedding question has been raised time and again in the construction industry. There's been much talk, but little final action.

One aspect of featherbedding—indeed, the one that gave the practice its name—is the forcing of employers to hire more workers than needed to handle a specific operation. Theoretically this was to spread the work, help keep full employment.

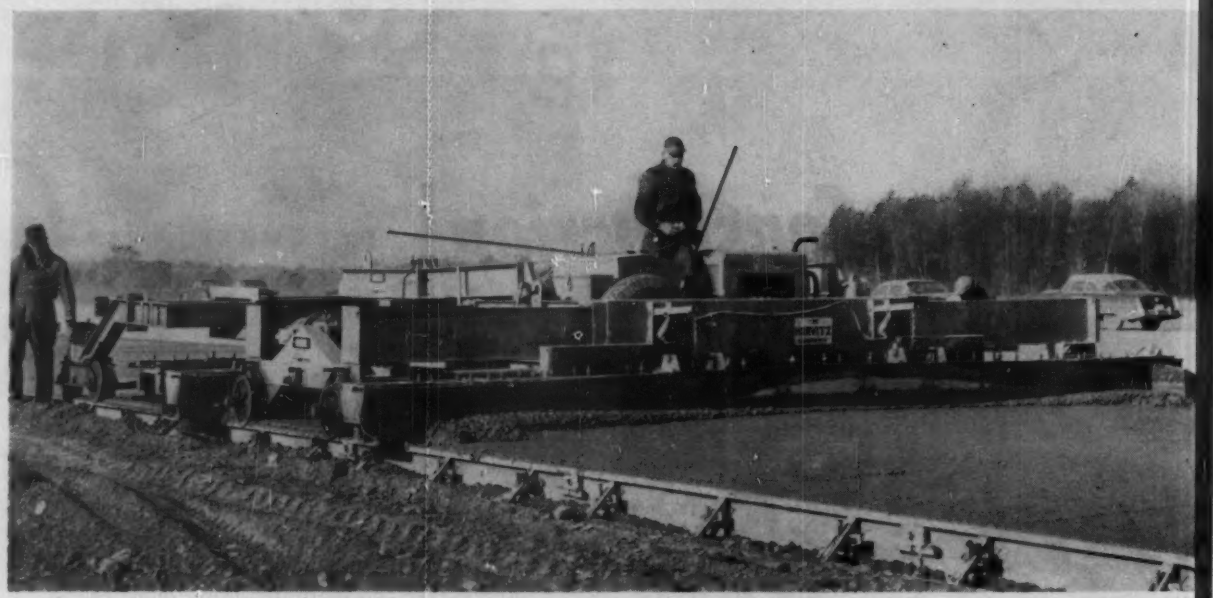
The practice has evils, of course. And it was excoriated as "beneath the innate dignity of the American workman" by the president of the Associated General Contractors at its annual convention nearly two years ago.

At that time, the Building and Construction Trades Department of the AFL-CIO adopted a 10-point statement of policy that said, in part: "Slowdowns, forcing of overtime, spread work tactics, standby crews, and featherbedding practices have been and are condemned." The statement was ratified by the general presidents of all the unions in the department.

Commenting on this, we editorialized that "ratification will mean nothing unless the principles are put into practice at the union local level. Only then will the contractor receive his 'full day's work for a full day's pay.' And only then will the buyer of construction get all he pays for."

Well, our statement still stands. In most instances the high resolves of the International unions have been ignored by the locals. In certain areas of the country, for example, an extra man must be hired solely to run the air motor of a self-propelled drill. In others, an operating engineer must be added to the two-man crew of a field service truck, yet all he does is start and stop the small compressor that powers some of the grease pumps and inflates tires. And so it goes—instance after instance of unnecessary men on the payroll, adding needlessly to the cost of construction.

On the other hand, there is evidence that the productivity of individual workers is rising. This is particularly true, as you would expect, in areas where contract awards are falling off and jobs harder to find. Nevertheless, the "innate dignity of the American workman" is coming through.



FINISHER — Front end of Heltzel Flex-Plane combination machine is equipped with two screeds. It handles the finishing. Front screed rides on forms; rear screed is suspended from hangers. Front end can be detached to work as an independent unit.

A COMBINATION finisher-float takes care of all concrete finishing in only one pass on a highway job near Painesville, Ohio. The rig requires only one operator and one laborer; two or three finisher-edgers with long-handled floats touch up after it.

The project includes 3 mi of four-lane road. The Horvitz Co. of Cleveland is the general contractor. Their paving train consists of spreaders for both the bottom and top courses, a Heltzel Flex-Plane gas-electric finisher-float, and a spray curing machine. The whole paving train requires a total of seven to eight skilled operators and five laborers.

A central-mix plant supplies the concrete; it is delivered to the spreaders by a fleet of Dumpcretes. On this job, the capacity of the concrete plant limits the paving speed, and the finisher is not working at full capacity. Recently, on another paving project the combination machine covered more than 5 mi in five days, and the manufacturer claims that it can finish concrete at the rate of 12 fpm.

The combination finisher is actually two machines in one. It is equipped with two screeds and a float, and it produces a smooth surface that requires no additional finishing.

The front end of the machine, with two 16-in. screeds, is the finisher. The floating front screed rides on the forms. Its stroke is adjustable from 4 to 10 in. The rear screed is suspended from the machine by special hangers. Set screws allow small elevation adjustments on this screed. The screed end wear plates are spring loaded. Both screeds oscillate in the conventional manner.

The machine's rear section is the float. It does not reciprocate but finishes the concrete by troweling. Surface contact area of the float is 30 in. wide. Float elevation is set in the same manner as that of the rear screed.

Screed speeds are adjustable independently from traction speeds. In addition, traction on each side of the machine can be adjusted independently. This enables it to finish around curves or to work adjacent to existing slabs. One side of the finisher can ride on rubber wheels on the slab while the other side rides on steel wheels on the forms.

There are two separate generators and electrical systems. They supply power to independent dc drives for the major operating functions. The Flex-Plane combination can be broken down into two sections. The front unit can work independently as a finisher with both screeds riding on the forms.

Width of the finisher section is adjustable from 12 to 26 ft. This is particularly convenient when finishing variable width ramps and approaches because a separate finisher is not necessary. In addition, the finisher section can be equipped with a hydraulic widener for variable width paving. Both the screeds and the finishing pan are easily adjustable for crown changes.

FLOAT — The combination machine's rear end is the float. Its troweling action gives the concrete a smooth surface that needs no additional finishing. The 30-in.-wide float pan is suspended from the machine and is adjusted with set screws.

The combination rides to the job site on its own running gear. The float section and the finisher section can be disconnected, and each unit rides on its own hydraulically controlled wheels.

Concrete Placing

Preceding the finisher-float are the two concrete spreaders that place the bottom and top courses. A Rex concrete plant supplies the concrete. Plant capacity is 150 cu yd per hr, and the mixing drum handles 6.6 yd at a time.

Horvitz also has the contract

An Ohio contractor's paving train includes only one finishing machine. It produces a smooth road surface in a single pass. One operator, one laborer, and two or three finisher-edgers with long-handled floats take care of all finishing operations.

Combination Machine Finishes Concrete in One Pass

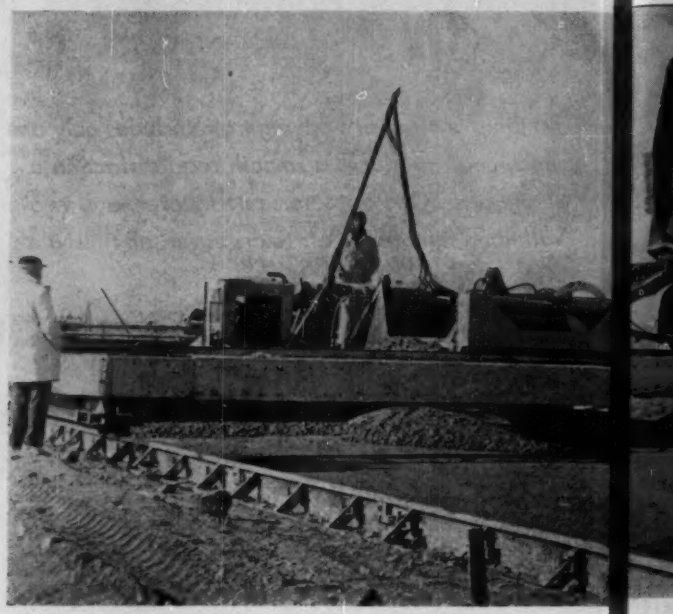
for an additional section of this four-lane road west of the present 3-mi job. To avoid moving the concrete plant at the finish of the first section, they located it near the west end.

They also started paving from the west end. Six Dumpcretes haul the concrete from the plant to the spreaders. As the paving train makes its way forward and the haul distance increases, Horvitz will add more trucks to the fleet. Paving at the east end will require nine Dumpcretes.

Each of the two concrete slabs is 24 ft wide and 10 in. thick. A Maxon spreader with a 6-yd hopper lays down the bottom course. Dumpcretes discharge

OVER THE ROAD—Finisher and float sections can be towed as separate trailers when disconnected. Each section is equipped with built-in, hydaulically controlled running gear.

AT THE PLANT—Mixing drum of the Rex plant handles 6.6 yd and delivers 150 yd per hr. Dumpcretes haul concrete to paving train.



BOTTOM COURSE—A Maxon spreader leads the paving train. It takes only 32 sec to spread one 6-yd load on the 24-ft-wide pave-

COMBINATION MACHINE . . . *continued*

into the hopper while the spreader is stationary. Then the spreader moves forward, and the hopper moves back and forth across the width of the pavement to place the concrete. It can spread one load in about 35 sec. Including the positioning of trucks and unloading, one spreading cycle requires less than 2 min.

At this rate the paving train could cover more than 500 fph. However, on this job the capacity of the concrete plant is not sufficient to maintain this speed so the spreader is sometimes idle between loads of concrete. On this job Horvitz is placing an average of 1,600 to 2,000 ft of concrete paving per day.

Behind the spreader is a carrier for wire reinforcing mesh. This rig was built in the contractor's shop to simplify the placing of the mesh. The unit is basically a frame mounted on eight steel wheels that ride on the forms. Sections of wire mesh are piled on the carrier and are simply pulled off one by one as the spreader pulls it forward. It takes two men to place the mesh.

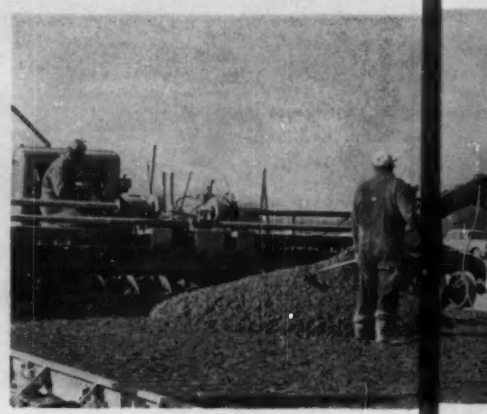
Another contractor-built machine spaces tiebars for longitudinal joints. This rig is attached to the spreader and precedes the wire mesh carrier.

The device consists of three steel disks mounted on a common axle. Three reinforcing bars are attached to the circumference of the disks. The bars are equally spaced around the circle and are parallel to the axle of the disks. Each bar is attached to all three of the disks. The three disks and the three bars rotate about the axle as a single unit.

As the spreader moves forward, the disks rotate and the bars leave imprints in the wet concrete behind the spreader at 2½-ft intervals. A supply of the 4-ft long tiebars is kept on the spreader, and they are placed on the concrete in the indentations left by the spacer mechanism. The Horvitz crew hopes to improve the device to space and place the tiebars automatically.

The spreader operator controls the device from the spreader. A single wheel controls the elevation of the disks so they will ride on the concrete. At present there are no other controls on this device.

The top course follows the reinforcing mesh. Dumpcretes discharge on the mesh, and a Jaeger spreader distributes the concrete



TOP COURSE—Dumpcretes discharge on the wire mesh, and Jaeger spreader dis-

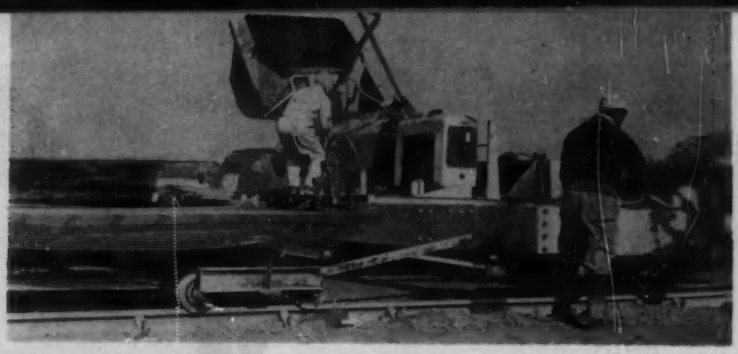
over the width of the road.

In addition to the spreaders and the finisher, there is a burlap drag that follows the finisher and a Heltzel automatic spray curing machine. After the concrete hardens, a Clipper concrete saw cuts the control joints.

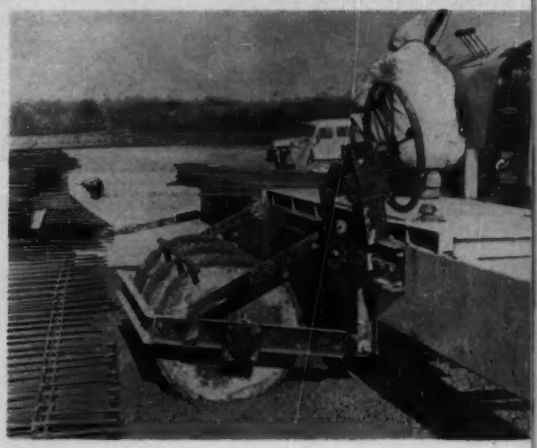
Subgrade Finishing

Ahead of the paving train, work crews and machines handle the various subgrade finishing operations. A Cleveland form grader levels the subbase for the steel highway forms. After the forms

to Paving Train



MESH CARRIER — Contractor's shop built this rig to simplify the placing of wire mesh. Two men simply pull sections of mesh off the carrier as the spreader pulls the rig forward.



BAR SPACER—This contractor built rig leaves imprints in the concrete at 2½-ft intervals. Longitudinal joint tiebars are simply dropped into each impression in the wet concrete.

ment. When working at full capacity, the spreader handles a 6-yd load every 2 min.

tributes concrete over the road. One operator and one laborer handle the spreader.

EASY TO LOCK—Heltzel Cam-Lok forms are locked with small hammer and wrench.

are placed, air hammers drive the pins home. A Jaeger compressor supplies the air.

Next, two Cleveland form tampers compact the subbase around the forms, and a Buckeye subgrader completes the fine grading.

Then the crew places dowels for expansion joints. Finally, just ahead of the spreader, a tank truck and one man with a hose water down the subbase. Because a paver is not used, a relatively small tank truck takes care of all water needs at the paving site.

Highway Forms

The forms that Horvitz is using on this job are Heltzel Cam-Lok highway forms, equipped with a lock that can be closed with an ordinary ball-peen hammer and a wrench.

On unused forms the locks can be slid into place by hand; on older ones a little help from the hammer does the trick. Heavy sledging that often damages the forms is not necessary.

After the lock is in place, a quarter turn of the cam aligns the forms and locks the treads. The cam expands the lock both vertically and horizontally, simultaneously aligning the tread and face of the form. The resulting form joint is rigid and cannot shake loose under either vertical or horizontal stresses and thrusts.

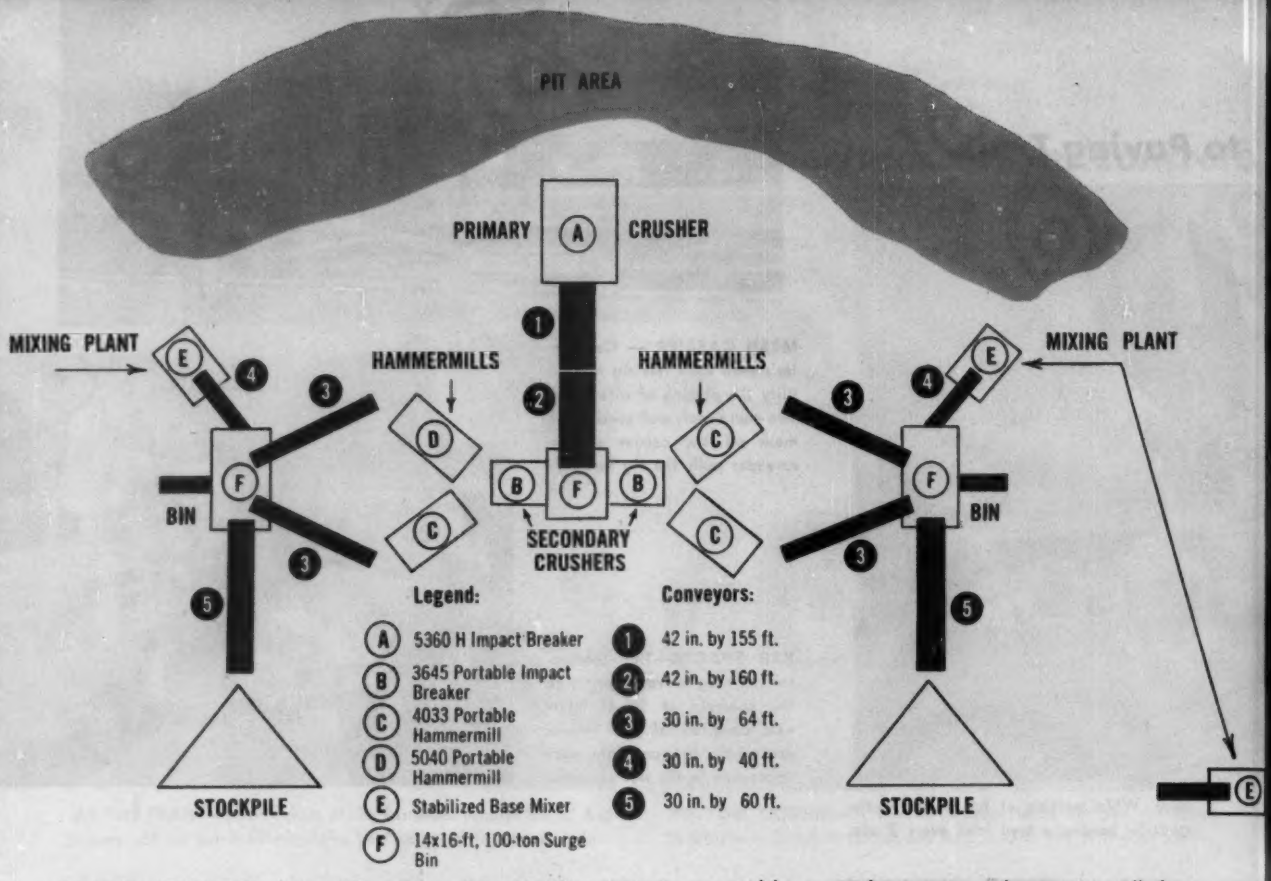
These forms are easy to place and to strip. Two men are placing all of the forms on this job. In one day they set forms for as much as 2,600 ft of paving.

When finished, this section of road will become part of Ohio Route 2 that will run northeast from Cleveland near Lake Erie.

In addition to the 3 mi of four-lane highway, there are over 4 mi of access and service roads and two grade separation structures. Pavement on the access roads is 9 in. thick. Total volume of concrete for the job is slightly over 27,000 cu yd. The contract price is $3 million.

Men on the Job

The engineer for Horvitz is E. Scott, and the superintendent is Charles Moderi. Pete Blosser is superintendent of paving operations, and Sam Calabreze is the paving foreman. Nick Paplyk supervises and directs the form setting and the work ahead of the paving train.



PLANT LAYOUT Arranged in a T formation with almost identical arms, widely separated points to avied congestion. All the plant can deliver its output to hauling trucks at major units except the primary crusher are portable.

Efficient Plant Pours Out Stone

Portable crushing units set up in duplicate and quadruplicate make a versatile, high-output plant that supplies four highway jobs in Iowa.

A 1,146,000-TON crushing contract completed in about 5½ months, two months ahead of schedule, is on the books for the Schildberg Construction Co. To pour out the stone that fast, the Greenfield, Iowa, contractor set up a plant combining stationary and portable equipment (cover photo). And they arranged the flow plan (above) so that trucks could remove the end product equally fast, without pile-up.

Schildberg was to supply 523,000 tons of granular subbase material and 623,000 tons of rolled stone base to four prime contractors for a 34-mi stretch of Federal Interstate Route 80 near Stuart in west central Iowa. Gradation specifications for both materials were somewhat similar, and the plant was set up to meet them simultaneously—that is, the plant's single end product fell within both specifications' limits. That for rolled stone base was:

Screen	Passing
1-in.	100%
¾-in.	75-100%
No. 4	40- 75%
No. 40	15- 35%
No. 200	9- 18%

While crushing and screening equipment was being readied, three Caterpillar DW21's push-loaded by D8's and D9's, began excavating overburden to uncover limestone that was to feed the plant. By the time the job was over, they had removed up to 35 ft of overburden from a 19-acre site. Spoil from the operation was spread as backfill in mined-out sections of the pit to restore the land to usefulness. In one area, the rigs leveled a landing strip for Schildberg's company plane.

The exposed limestone had to be drilled and blasted to feed the plant. Gardner-Denver 500-cfm and 600-cfm portable compressors furnished air to two G-D wagon drills that put down the blast holes. Working against a 17-ft face, two Northwest 80-D and two Model 6 shovels loaded out the shot rock. Five Euclid 18-ton trucks and three Euc S-12's with Easton rear-dump trailers hauled this material to the plant.

Plant equipment, with the exception of two Kolman 30-in. conveyors 60 ft long, was all Cedarapids, powered by 19 General Motors and Caterpillar diesel engines whose total rated

PRIMARY AND SECONDARIES Hauling from quarry in background, a rear-dump unit feeds double impeller impact breaker in pit. Its product is split at bin to feed dual lines for more crushing.

at 10,000-Ton-per-Day Clip

continuous horsepower was in the neighborhood of 5,000. And with the exception of the primary crusher, bins, and most of the conveyors, all units were portable.

Schildberg laid out the plant in a T formation for efficient flow through it. Material entered at a primary crusher at the base of the T's stem and flowed out both arms of the T to discharge at four truck-loading stations. Within each arm, the tertiary crushers were twinned.

The T layout not only eliminated truck traffic jams but also allowed smaller crushing units to be used; but of course, more were needed. Nevertheless, because of their portability, Schildberg can combine them in many ways in the future to handle different size jobs and various inputs and end products.

At the plant set up for the Route 80 job, pit-run material was dumped to a 50-in. by 14-ft

HAMMERMILLS Product of secondary is split to feed two hammermills for final reduction. Finished material from each is recombined in surge bin.

MIXING Water is added to crushed limestone in twin-shaft pugmill stabilized base mixer to bring it to optimum moisture content before placement.

QUARRYING Four shovels load out shot rock for delivery to crushing plant in background. Five rear-dump trucks and three trailers are hauling.

BACKFILLING Scraper fleet backfills quarried-out section of pit with overburden removed during course of exposing new area for shovel digging.

EFFICIENT PLANT . . .

continued

apron feeder. This led to a large double impeller impact breaker set on heavy foundations in a pit 30 ft below ground level. Breaker feed opening was 53x60 in., and discharged material was about 7-in.-minus size.

Conveyed 315 ft out of the crusher pit and into a 100-ton surge bin, product from the primary was split in half. Each part went through a 3645 portable double impeller impact breaker that reduced material to approximately 3½-in.-minus.

This discharge from each secondary went through a splitter chute to be divided to feed two portable hammermill crushing and screening plants. After final reduction there, material from both units was recombined in a 100-ton surge bin.

From the bin, a 42-in. belt conveyor loaded units of a fleet of seven Chevrolet tandem dump trucks that hauled finished material to an adjacent stockpile. Eventually this stockpile grew to 320,000 tons.

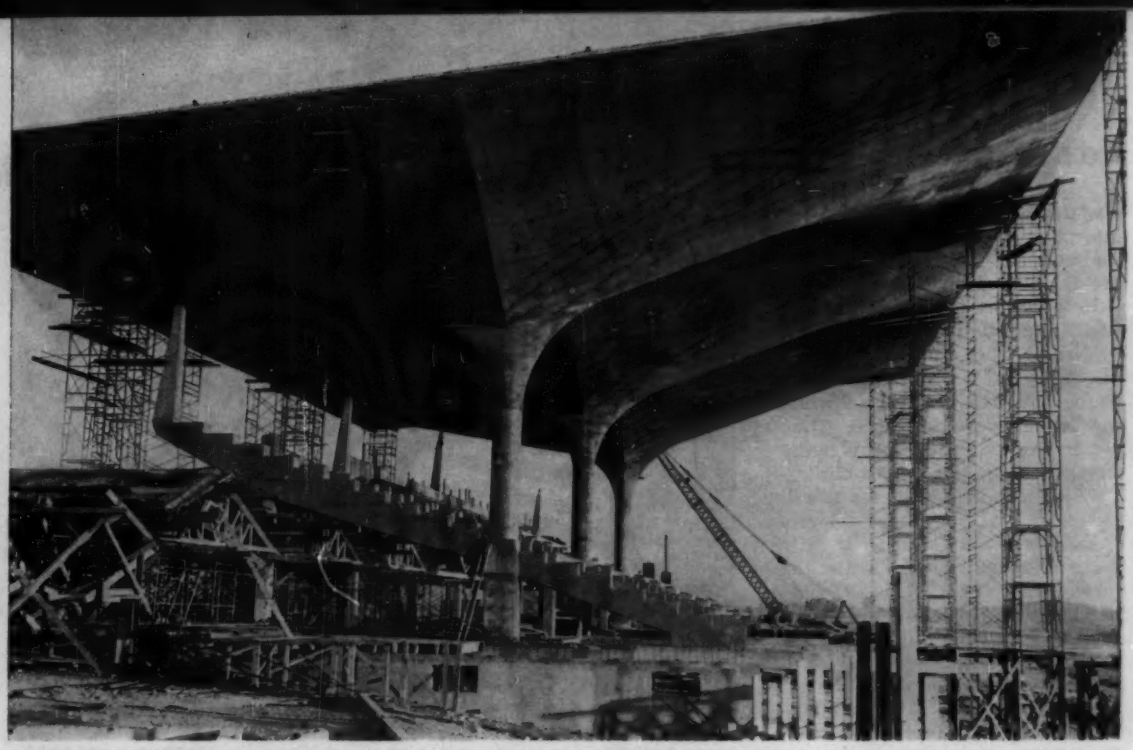
Also from the bin, a 36-in. by 10-ft feeder put crushed stone onto a belt leading to a twin-shaft pugmill stabilized base mixer. Here approximately 8% water was added, pumped from the nearby Middle River. Mixed material was hauled directly to the roadbed.

Because all the crushed stone from the plant had to be brought up to optimum moisture content Schildberg set up a third pugmill mixer that was fed from the stockpile. Also, provision was made to feed material from the stockpile back to the final plant bins for transfer to the other two pugmills.

With an average crew of 55 men during the height of the job, the plant produced crushed stone at a 10,000-ton-per-day clip. Peak production was 12,000 tons in 11½ hr.

But the four prime contractors for whom Schildberg was producing the stone removed it even faster—their total of 120 tandem dump trucks hauled away as much as 21,000 tons a day. Top figure for a 6-day week was 103,000 tons.

For Schildberg, Kenny Ulrich was superintendent at the Route 80 job plant, Frank Maynes was truck foreman, and John Waalk was pit foreman.



UMBRELLA ROOF—Three hyperbolic paraboloid concrete roof shells shelter portion of grandstand. Scaffolds at the corners of each shell are left in place for 28 days after concrete is placed. Small posts in back of each support column stabilize the roof.

Race Track Builder Races Time

Ohio contractor works fast to build race track in just five months. Inverted hyperbolic paraboloid shells covering grandstand are biggest in the U.S.

A CONTRACTOR won the first race at Scioto Downs, a new harness racing track near Columbus, Ohio. Sheaf Construction Co. of Columbus erected a concrete grandstand sheltered by three inverted hyperbolic paraboloid shells in just five months, and the track opened for the racing season on schedule.

The roof shells were not easy to build. The 60 x 116-ft shells are the biggest inverted umbrella shells in the U.S. Each rests on a single column and is tilted; the front edge is 65 ft above the track, but the rear edge is 12 ft lower.

Shell thickness is 5 in. in front of the column and 4½ in. behind. Two stiffening ribs on the top surface of each shell taper from a thickness of 2 ft 1 in. at the column to about 1 ft at the edge.

To beat the clock, Sheaf formed and poured all three shells at the same time. Roof forms were built in place. They used more than 5,000 scaffolding frames to support the forms. Two-thirds of these were Safway; the rest were Adjustomatic.

The forms consisted of a grid of 2x6's and 4x6's covered with 4x8-ft sheets of 3/4-in. plywood that was slightly warped to fit the curvature. It took about 2½ weeks to build the forms. On top of the forms a uniform network of steel bars reinforced the shells. Heavy bundles of steel went into the stiffening ribs.

Concrete Placing

As soon as the forms were built and the steel was in place, they poured concrete. The mix consisted of 6 bags of Type I cement per cu yd, 6 gal of water per sack, and 3 to 5% air entrainment. A retarder was used in the shells only. Anderson Concrete Corp. of Columbus supplied the ready-mix.

Two cranes with 3/4-yd buckets placed 170 cu yd of concrete for each roof shell. One of the cranes was a Manitowoc 2300 with a 90-ft boom and 50-ft jib; the other was a 25-ton Bay City with 100-ft boom and 25-ft jib.

Concrete was finished by hand and sprayed with a curing membrane. It was covered with burlap and kept wet for seven days. Specifications called for a 3,500-psi strength before stripping. Sheaf was able to start stripping after five days.

All of the forms and the shoring were stripped except for the scaffolds supporting the corners of each shell. These were left in place for 28 days.

When first poured, the shells were separated from each other by open gaps. These were filled in after stripping. Special form panels supported this concrete. Threaded hangers supported from above the roof held the forms in place. After curing, the forms were removed and the hangers left in the concrete.

Support Columns

One 3-ft-dia reinforced concrete column supports each shell. A 6-in. pipe in the center of each column drains the roof.

The columns were cast in place after the grandstand frame was erected. Reinforcing steel

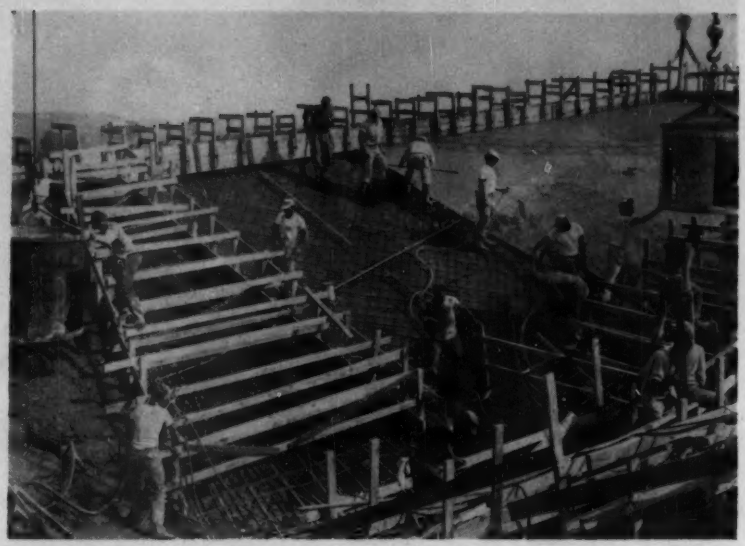
Crowded Schedule Means

was tied on the ground and lifted into position. The plywood forms for column capitals also were pre-fabricated on the ground.

In addition to the column, a small post helps stabilize each roof shell. The posts were poured integrally with the grandstand frame and tied to the roof when the shells were in place. They were finished after forms were stripped from the roof shells.

When completed, the track will have a total of five umbrella shells. Because of the rush, only three were built in time for the races; the others will be completed later. However, the entire seating area was built before the races, and Sheaf kept as much work as possible going on at all times.

The grandstand provides seats for 2,600 and standing room for 7,800. Seats are arranged in 18 rows. Above the track level and in front of the seating slope are three rows of box seats. Offices and other track facilities are located at track level below the seating slope.



ROOF POURING—Shell and stiffening ribs contain 170 cu yd of concrete. Hand-finished concrete is sprayed with curing compound, covered with burlap, kept wet for seven days.

HIGH CONCRETE—Manitowoc crane with 90-ft boom and 50-ft jib works from an earth mound to raise concrete to top of roof shell. Two cranes place concrete for roof.

A mezzanine area under the seating slope in back of the grandstand contains pari-mutuel windows and concession stands. The mezzanine runs the entire length of the grandstand and is covered by a folded plate roof.

Seating Area

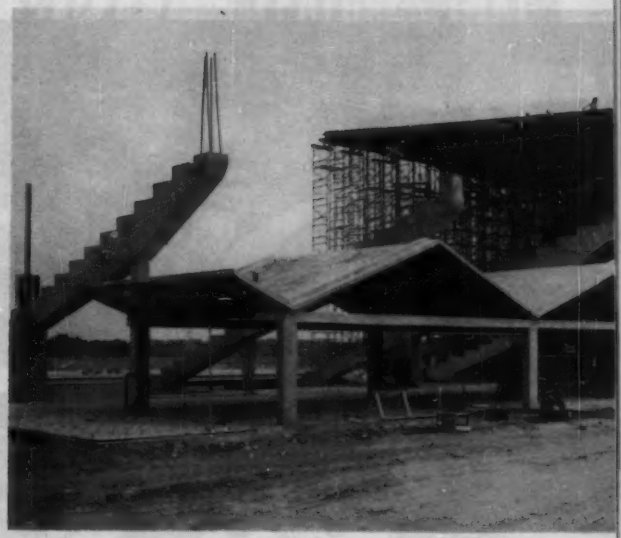
At the start, structural work on all parts of the grandstand proceeded in a normal sequence. First, the reinforced concrete frame and column bases were poured. Next followed the support beams for the seat deck slabs and then the columns.

After the frame was in place, Sheaf erected precast prestressed double-T beams to form the floors for the mezzanine and the box seat area. The floor is topped with 2 in. of concrete. A 35-ton Manitowoc crane with 80-ft boom and 30-ft jib handled this part of the erection. Concrete Masonry Corp., Elyria, Ohio, supplied all prestressed concrete members.

While the roof shells were being erected, Sheaf crews placed the 30-ft long precast prestressed tread-and-riser seat slabs for the unroofed portion of the grandstand.

Working Everywhere at Once

PRECAST CONCRETE—Mezzanine floor in back of grandstand is composed of precast prestressed double-T beams spanning 28 ft.



FOLDED PLATE—The mezzanine roof consists of nine pairs of 4-in. thick folded plates with a cantilevered partial plate at each end.

They also worked on the folded plate mezzanine roof. It is 282 ft long and 26 ft 8 in. wide. Shell thickness is 4 in. The folds rest on 10 pairs of columns. A cantilevered partial plate extends from the last pair of columns at each end.

They formed and poured two folds and one cantilevered partial plate of the mezzanine roof. The remaining folded plates and tread-and-riser slabs were placed after forms were stripped from the three roof shells.

Construction to be completed after the races includes the club house with a 100x160-ft folded plate roof and the remaining two umbrella shells.

When completed, the structure will contain 7,000 cu yd of ready-mixed concrete, 494 precast prestressed concrete members, and about 412 tons of steel.

The entire $2.25-million racing facility includes the grandstand and club house, concrete block barns with stalls for 600 horses, five-eighths of a mile track, and parking space for 5,000 cars.

Architects for the race track are Kellam & Foley of Columbus, and the structural engineers are Gensert, Williams & Assoc. of Cleveland. Project engineer for Sheaf is William Sheaf; job engineer is Owen Bradford; Herbert Underwood is the superintendent.

UNDER THE ROOF—Mezzanine roof is completed after forms and shoring are stripped from roof shells. Stabilizing posts under the roof are finished at the same time.

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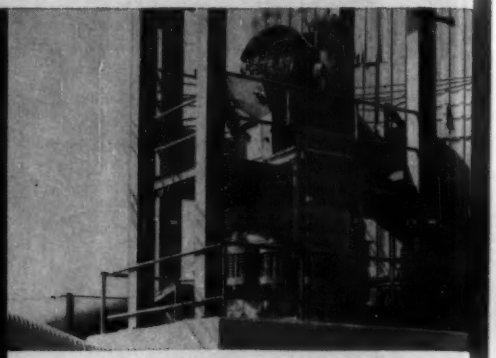

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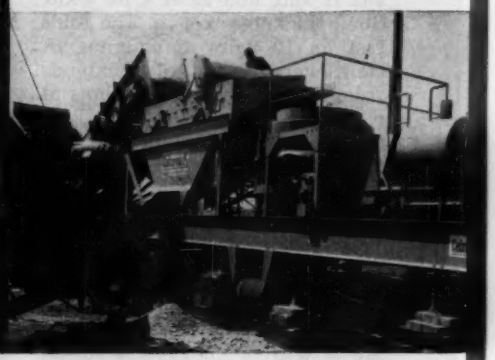

Typical of today's modern highway construction is this view of the modern Freeway in Oakland, California, showing three levels of highway structure over two levels of railroad.
(Photo courtesy California Division of Highways)

C-159

The big tonnages of specification aggregate, bituminous mixes, crushed sand and cement required to meet the ever-increasing needs of the construction industry are produced by Symons Cone Crushers at low cost. Good reasons why these efficient crushers are the leading choice of producers and contractors building highways, dams and hydro projects, bridges, as well as commercial building construction.

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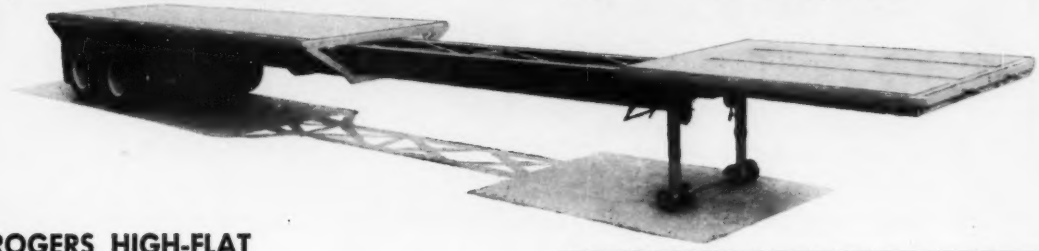

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No trouble with rock drills on this job reports Ralph E. Mills Company, Frankfort, Kentucky. This drill is lubricated with Gulf Rock Drill 63, a special lubricant for air-operated tools.

Mills men check with the Gulf man. Left to right: W. A. Ferguson, Superintendent, Ralph E. Mills Company; E. W. Mueller, Gulf Sales Representative and Emmett W. Mills, Assistant Superintendent, Ralph E. Mills Company, Frankfort, Kentucky.

Man-made pass through Thorn Hill on the outskirts of Frankfort, Ky., where Ralph E. Mills Co. cut a 400,000-yard slice through solid limestone. All equipment serviced with Gulf fuels and lubricants.

Speeds 400,000-yard cut through solid rock using Gulf lub

GULF MAKES THINGS R

One of the largest rock cuts ever made in Kentucky was recently completed by Ralph E. Mills Company, Inc., general contractors. The cut makes way for a modern 4-lane highway through Thorn Hill into Frankfort.

Mills made two cuts through solid limestone, totalling 400,000 cubic yards of rock that weighed 2,800 pounds to the cubic yard. One cut was 104 feet deep, the other 135. They finished the job in 10 months—and with plenty of proof that Gulf makes things run better.

"When you're working rock rather than dirt, equipment usually wears out about 40% faster," says W. A. Ferguson, Job Superintendent on the project. "Some contractors try to beat this by using a special lubricant for each machine.

"But with Gulf lubricants we found that this wasn't necessary at all. With the help of Gulf Lubrication Engineers, we greatly reduced the number of lubricants required on the job—and we saw no signs of premature wear. Our equipment included a Northwest 2½-yard shovel, five 15-ton Euclid trucks, a D-8 Caterpillar, a Gyro-Flow Ingersoll Rand compressor and three Gardner-Denver rock drills. All of our lubrication was done

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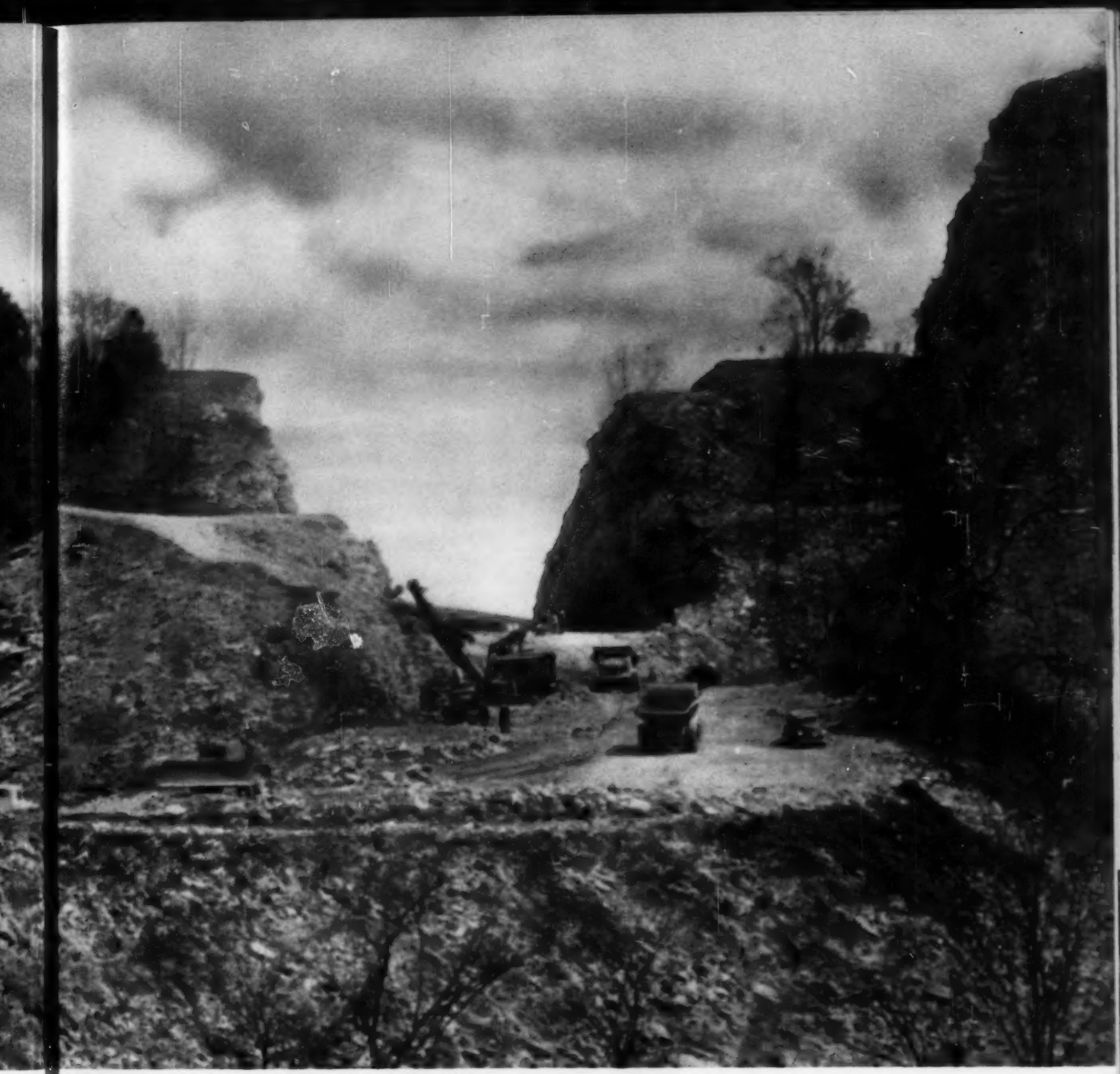

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HOW TO KEEP DITCHER TEETH SHARP...
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Two teeth with same number of hours on same machine. At left, sharpness is retained with STOODY 100; at right, edge of unprotected tooth is blunted.

1 *Line up several teeth against a tilted carbon block. Cutting edges should be approximately level and teeth closely butted.*

Dull teeth and frequent changes take the profit out of ditching operations. The answer—hard-face teeth before they are installed and repeat the hard-facing as they wear.

2 *Now make a continuous pass of STOODY 100 applied semi-automatically along cutting edge, tieing all teeth together. Second pass of STOODY 100 is molded to sharp edge by carbon block beneath. Dropping teeth flat on concrete floor breaks them apart. This welding technique saves time, keeps sides square without individual welding attention. Same system can be used with standard Stoody manual electrodes.*

A Texas contractor follows this plan, uses the semi-automatic welder applying STOODY 100 to keep teeth sharp longer and reduce time out for changes. The photos show how it's done. *This contractor has found that teeth protected with STOODY 100 working in limestone and shale are good for better than 150 hours,* while unprotected teeth are worn to destruction in 30 hours with several sharpenings necessary in-between.

Many operators of ditching equipment operating in extremely abrasive soils find that one or two passes of STOODY TUBE BORIUM, a tungsten carbide material, on tooth points give an amazing increase in service life—outlasting all ordinary alloys.

Your Stoody dealer will be glad to demonstrate the semi-automatic welder in your shop. Check the Yellow Pages in your phone book for his name and address or write for dealer's name and complete information to

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DOUBLE CAPACITY—Cat D8 bulldozer has no trouble pushloading tandem LeTourneau-Westinghouse scrapers with combined capacity of 40 cu yd. California contractor finds tandem scrapers highly effective for short haul earthmoving on subdivisions grading job.

Tandem Scrapers

A Good Bet for Short Hauls

CONNECTING SCRAPERS in tandem, an old earthmoving technique that hasn't been used much in recent times, is making a comeback in California. Blakemore Equipment Co. of Oakland has combined standard LeTourneau-Westinghouse components into 40-cu-yd capacity rigs that have worked successfully on several jobs. Blakemore calls the units "Twinpaks."

The Blakemore rigs need no extra power takeoff to handle the cables for the second scrapers; standard LW electric motors, operating at 3,600 rpm, do the job. This eliminates hundreds of feet of cable. A 300-v generator mounted on the Tournapulls supplies power. The same generator supplies the electric steering motor.

The Blakemore tandems consist of two C Fullpak scrapers. Most of the rigs have been mounted behind a 270-hp C Tournapull. But one was connected to a 276-hp four-wheeled Speedpull tractor unit.

Martin Bros. of Concord, Calif., bought two Twinpaks for a 300,000-cu-yd subdivision grading job near Richmond, Calif. Martin figures they replaced five single scraper units on this work.

Martin push-loaded the tandem units with a single Cat D8 tractor. There were two D8's in the borrow area, but one worked almost full time on ripping. Only rarely was it necessary to double team the pushers.

Operation

The scraper operator uses a rear view mirror to guide him during loading. His controls for the second scraper are mounted on the dashboard and consist of a series of switches occupying a space about the size of a postcard.

With hauls of 1,000 to 1,500 ft, the Martin rigs operate in cycles substantially less than 5 min. They are capable of making 180-deg turns within a 40-ft width.

Bill Martin of Martin Bros is extremely well satisfied with the rigs. He plans to use them on jobs with longer hauls, where he expects even greater economies than on the subdivision work.

John F. Blakemore, who heads Blakemore Equipment Co., says that tandem scrapers are a definite trend. Blakemore says that his next project will be to tandem-mount a pair of LeTourneau-Westinghouse B scrapers. This would give a 56-yd heaped capacity without sideboards. And he sees no reason why three scrapers cannot be mounted together in a scraper train; he may try such an arrangement during the next few months.

Blakemore points out several advantages of the tandem rig. It uses two less tires than a pair of single rigs. It provides double the capacity of a single rig for only 27% more cost. A D8 tractor normally can load a tandem unit with 38-yd heaped capacity. Finally, where grades are so steep that a single scraper must be substituted, it takes only 15 min to unhook or hook up the second scraper.

Connecting scrapers in tandem, an almost forgotten technique, is becoming popular again as contractors find it often cuts earthmoving costs. An expert explains how to figure relative tandem and single scraper costs.

An Easy Way To Figure When to Use Tandem Scrapers

By D. K. HEIPLE
Chief Field Engineer
LeTourneau-Westinghouse Co.

ACHIEVING the lowest unit cost in scraper earthmoving depends on finding the best balance between scraper capacity and tractor power.

The balance varies with every job. Weight of the material, grades, and rolling resistance all affect it. Methods of attaining the proper balance also vary. Use of sideboards, widening or lengthening the scrapers, changing the size of scraper or engine, and adding engines are common ways to do it.

One of the oldest ways of adding capacity is to hitch a second, or tandem, scraper behind the first. Early jobs featured a steam tractor hauling a string of as many as a dozen scrapers. This method disappeared with the development of fast tractors and large single scrapers.

But recently there have been several successful revivals of tandem scraper operations. Contractors are finding that, under some conditions, tandem scrapers can cut earthmoving costs.

Adding a second scraper of the same size doubles the capacity of the team. But all of the factors affecting cost do not double. For instance, width and height are unchanged. Length is increased but not doubled so turning radius increases only 10-15%. Axle loads, gross weight, capital costs, and operating costs all increase less than 100%.

No extra pusher power is needed because tandem scrapers are loaded individually. And the tandem setup is more versatile; capacity is halved or doubled simply by unhitching or hitching the second scraper.

To see how these ratios work out in a specific example, assume a 270-hp wheel tractor and a 14-yd struck capacity scraper having a total cost of $43,000. To this we add a second 14-yd scraper as a semi-trailer. This doubles the capacity. Here's what happens to other cost factors.

Power-to-Weight Ratio. The power is 270 hp in each case. For the single scraper, the empty weight is 22 tons and the load weighs 22 tons, making a total of 44 tons. The power-to-weight ratio is 6.14 hp per ton. The tandem scraper setup weighs 38 tons empty and carries a 44-ton load, making a total weight of 82 tons. The power-to-weight ratio is 3.27 hp per ton. Comparing the two ratios, we find that the single is only 1.87 times as great as the tandem, not double.

Capital cost. Adding the second scraper increases the total cost of the team from $43,000 to $60,000. This difference includes the second scraper, higher ply tires for the center axle carrying the hitch load of the second scraper, and controls for the second unit. The cost is not doubled; it increases only 1.4 times.

Operating costs. Hourly owning and operating costs are estimated at $16.65 for the single and $21.75 for the tandem. These costs were assumed to be 0.0003 times list price plus an operator cost of $3.75 per hr. Thus the tandem costs about 1.31 times as much to run as the single scraper.

If the costs were doubled along with the capacity, the two units would have to make equal cycles to produce equal costs. But the tandem costs are less than double. Therefore the tandem requires fewer trips to produce the same costs.

If, for example, the tandem makes 10 trips per hour with 28-yd loads, the dirt cost will be $21.75 (the hourly cost of operating the tandem) divided by 280 yd (the production), or $0.0775 per yd.

To match this price, the single scraper, costing $16.65 per hour to operate, must move 215 yd of earth (16.65 divided by 0.0775). With its 14-yd payload, the single scraper must take 15.3 trips to move 215 yd. So the single scraper must take 1.53 trips for every 1 trip of the tandem to maintain equal costs.

Power Advantage

We have already seen that the single unit has 1.87 times as much power as the tandem. If it can use 100% of this power, it could make 1.87 times as many trips and produce cheaper yardage because it takes only 1.53 trips of the single to equal the tandem costs.

But in practice, the single never uses 100% of its power advantage. How much less it uses is determined by job conditions such as length of haul, curves, and grades.

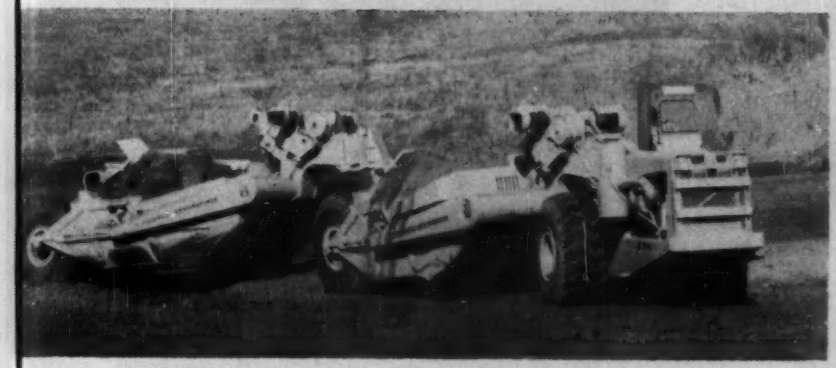
Table 1 compares tandem and single scrapers under changing job conditions. To produce such a chart, assume that the tandem makes 100 loads in a given time. If the power of the single is usable 100% of the time, it will make 187 loads in the same period. This gives you the first line in the chart.

Next assume that the power is fully usable 90% of the time and equal in 10%. Then, while the

TABLE I

Number of trips each rig can make depends on job conditions.

Percent of Time Extra Power Of Single Scraper Is Usable	Number of Trips	
	TANDEM	SINGLE
100%	100	187
90	100	178
80	100	169
70	100	161
60	100	152
50	100	143
40	100	135
30	100	126
20	100	117
10	100	109
0	100	100



tandem makes 10 trips, the single also makes 10, and while the tandem makes the additional 90 trips, the single makes 168 (1.87 times 90). Use the same calculation for each of the remaining percentages.

Of course, the two rigs do not run equally for 10 trips and unequally for the remainder; that is simply a device to make the calculations easier. The actual situation would be an equal speed for 10% of each trip and different speeds for the remainder.

Note that on this chart the approximate breakeven point is 60%, assuming that 154 trips are necessary for equal costs.

These figures apply to the LeTourneau-Westinghouse Model C Tournapull. The same principles apply to other machines, but individual calculations should be made in each case.

The difference in power is reflected in the top speeds of the units. Therefore the chart indicates that for the tandem to be a cheaper alternative, job conditions should limit the time that the units can run at top speed and hence reduce the relative advantage of the single.

This condition usually exists when the combination of rolling resistance and grade resistance is below 60 lb per ton on the loaded run and below 120 lb per ton on the empty run. Or, as a rule of thumb, tandems are effective when roads and grades allow both units to travel at the same speed on either the loaded or empty run.

Table II gives some specific cases. Case No. 1 is for a haul distance of 3,000 ft on a 60 lb per ton road down 2% grade, returning over the same course. In this case the tandem is more effective.

In Case No. 2, the rolling resistance changes to 100 lb per ton with other factors unchanged. The unit costs then are about equal. Any further increases in grades or rolling resistance would favor the single unit.

Case No. 3 is an exception to the rule of thumb. Here the haul distance is so short that higher speeds cannot be reached. It assumes a 300-ft one way haul with 200 lb per ton rolling resistance. The tandem normally is limited by its power to 5 mph top speed loaded and 9 mph empty. The single unit can reach double these speeds. But the extremely short haul distance is largely used for accelerating and slowing down and both units are limited to an average speed of 6 mph. The tandem suffers only on the loaded portion and proves to be cheaper overall. If the distance had not slowed the single, its cost would have been $0.066 per yd.

On many jobs, then, a tandem scraper can produce cheaper dirt, and on most, a tandem team will haul substantially more yards per hour than the single unit.

	CASE 1		CASE 2		CASE 3	
	SINGLE	TANDEM	SINGLE	TANDEM	SINGLE	TANDEM
Time for Loading, Dumping, Turning, And Accelerating (min)	2.25	3.00	2.25	3.00	2.25	3.00
Haul Time (min)	1.58	1.58	1.58	2.49	.57	.83
Return Time (min)	1.58	2.49	2.17	3.78	.57	.57
Total Cycle (min)	5.41	7.07	6.00	9.27	3.39	4.40
Trips per 50-min Hour	9.25	7.07	8.33	5.4	14.95	11.35
Cubic Yards per Load	14	28	14	28	14	28
Cubic Yards per Hour	129.5	198	116.5	151.2	207	318
Hourly Ownership and Operating Costs	$16.65	21.75	16.65	21.75	16.65	21.75
Cost per Cubic Yard	$0.1285	0.11	0.143	0.144	0.0802	0.068

TABLE II Three examples compare earthmoving costs per cu yd for tandem and single rigs. Jobs with short runs and steep grades tend to favor a tandem setup.

5 reasons why Atlas Copco's "TIGER" is best for stoping and all short-hole drilling!

(1) It's fast and easy to handle!

(2) It's easy collaring, with little recoil!

(3) Features a retractable air leg!

(4) Convenient controls, automatic back head!

(5) Operates on single air supply!

Here's the TIGER—a new, fast, compact rock drill with power and stamina to meet toughest drilling requirements! Its high percussion rate not only speeds penetration, but at the same time cuts recoil to a minimum. With controls conveniently located, collaring is unusually easy.

What's more, the automatic back head prevents dry collaring. Flushing water actually flows before drilling starts. And, the Tiger's "constant blowing" provision sends air through the machine the instant pressure is turned on, keeping water and cuttings from the rotation chuck.

There's still another "plus"—the Tiger's exclusive integral type pusher leg, with retractable piston rod. Operates on a single air supply!

This isn't the whole story by any means. For more facts about the amazing new Tiger rock drill and how it can speed *your* drilling, call your nearest Atlas Copco representative. Or, write to us at Dept. CM-10.

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TITAN BASE—Three underground shafts, called silos, form the guts of the installation. Foreground silo is for equipment, the center silo will contain the missile, and the rear silo is for fuel. All three silos will be connected by 10-ft-dia personnel tunnels.

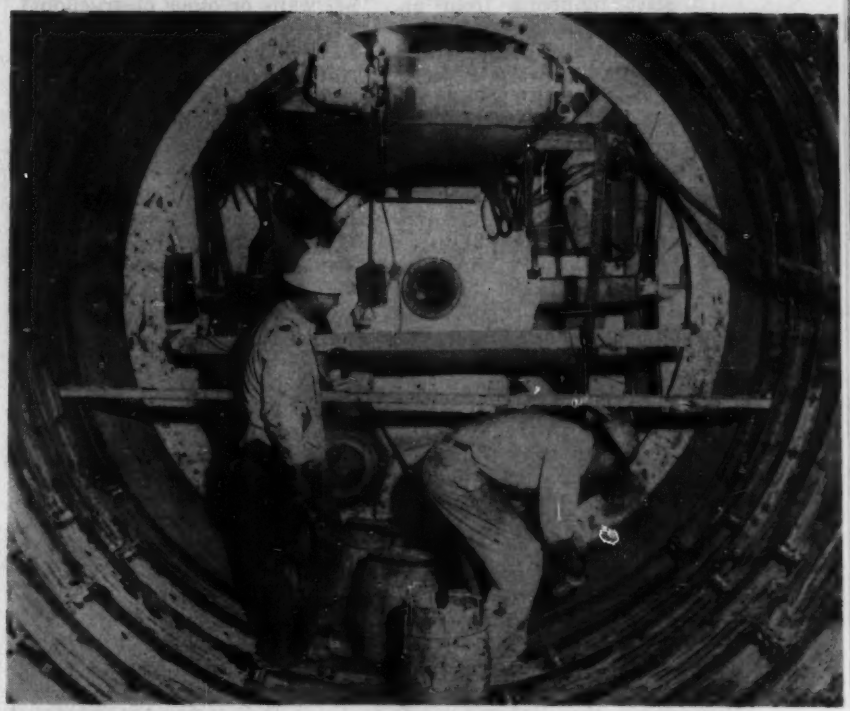
Unusual Tunneling Machine Bores Tunnels for Missile Base

A TUNNELING MACHINE, called the Badger, did an impressive job of cutting personnel tunnels for an underground Titan missile facility at Vandenberg Air Force Base in California. The Badger chewed its way through 1,300 ft of blue shale to cut a series of 10-ft-dia tunnels.

The machine was invented and built by Lawrence L. Morris of Whittier, Calif., who still owns the machine. It is the only rig of its kind in existence. Morris and an operating crew were on the payroll of the contractor during the tunneling operation; the Badger was leased to the contractor on an hourly rental basis.

General contractor on the Vandenberg job is a joint venture of Matich Bros. of Colten, Calif., and M. M. Sundt of Tuscon, Ariz. They subcontracted the mining work to NorthCal, Inc., who hired Morris and his machine.

The Badger cuts through the ground with chisel-shaped carboloy-tipped knives. The knives protrude from radial cross members of a rotary cutting head. A



THE BADGER—Lining crew follows directly behind the Badger to install liner plates. Rear view of machine shows overhead conveyor that removes material cut from face.

Badger Burrows Through to Silo— Crane Lifts It Up to Surface

BADGER EMERGES—When Badger cuts through to open silo, crews attach crane cables to it. Badger continues to grip the sides of the tunnel with its hydraulic plates.

30-hp 220-v, ac electric motor turns the cutting head.

Broken-out material drops freely and is picked up by scoops on the rim of the rotary head. The scoops dump into a hopper mounted directly over the power shaft. From the hopper the material passes onto a conveyor that carries it back to a muck car.

Behind the cutting head, the motors and other mechanism of the Badger are enclosed by a cylindrical 10-ft dia steel shield about 10 ft long. The operator is protected against flying bits of material by panels of steel and plywood directly behind the cutting head.

Moving Forward

To start tunneling from an open cut, the Badger is braced against the opposite bank by timbers. To move forward, it jacks itself against the timbers.

Once inside the tunnel, the rig needs no further assistance. It braces itself against the tunnel on either side. Mounted near the back end of the shield are two pressure panels. A hydraulic system, powered by a 7½-hp electric motor, creates a 30-ton push against the pressure panels. The panels push against the tunnel walls to give the Badger a firm hold.

To move ahead, two other hydraulic cylinders parallel to the drive shaft push against the panels. The same cylinders regulate pressure against the cutting head.

As the rotary head cuts and excavates the material from the tunnel face, the machine inches ahead, pushing against the pressure panels, which remain locked in place. The slots for the panels are long enough to permit about 1 yd of forward movement. The pressure is then relaxed while the panels are moved forward to take a new grip.

The Badger also can move backward by the same method. Although it doesn't have to do it on this job, it could back itself out of a completed tunnel (prior to the installation of tunnel walls or other obstructions).

The power shaft is mounted so as to allow slight angling of the cutter head. This allows the Badger to turn. The angle of the shaft is controlled by a sliding plate on the shaft, just behind the head.

This angling device governs both horizontal and vertical alignment of the machine. Thus the Badger can follow both line and grade and also can back off and correct itself if it happens to get slightly off course.

"We can cut a spiral tunnel or just about anything that's wanted," says Morris, "as long as the engineer can check us and tell us exactly where we are. We make that easy for him by providing a lighted target at the front of the machine. Working with the grade checker, we keep the target centered on the cross hairs of his transit, and we know we're moving ahead on course."

According to Morris, the Badger's best production at Vandenberg was 21 ft in 7 hr. But that is not the machine's top rate. A lot of time was lost waiting for the return of the muck car that the contractor used to haul out the excavated material.

"If I had been able to use a conveyor to carry the dirt all the way out of the tunnel," says Morris, "I could have operated continuously and finished two months earlier."

In spite of this, the men on the job were pleased with the production. Ted Prescott, foreman for NorthCal and a veteran tunneling man, said he was amazed at the Badger's performance. Walt Jarvis, project manager for M. M. Sundt, admits that the Badger was a factor enabling his company to submit the low bid for the job.

So smoothly did the Badger cut, that spalling from the tunnel was negligible. A liner plate crew followed right behind the machine, installing steel liner plate fabricated by Commercial Shearing and Stamping Co.

Because the liner plate was installed immediately, the Badger did not get a chance to demonstrate how it could back out of the tunnel. Instead, it tunneled through to an open cut or a silo and was lifted out.

The personnel tunnels connect the command control center with three separate groups of underground cylindrical structures called silos. Each group has three silos, making a total of nine. The

CRANE TAKES OVER—With crane cable securely in place, the Badger releases its hold on tunnel walls and crane removes it.

ON ITS WAY—Crane now has swung Badger completely free of tunnel. Plates that braced Badger inside tunnel are visible.

biggest silo is 160 ft deep and 40 ft in dia.

The Badger cut tunnels right through to a previously excavated silo. Then a crane pulled the machine from the tunnel and hoisted it to the surface. The Badger itself played an important role in the removal operation.

When it reached the silo wall, it pushed itself two-thirds of the way out into the silo excavation. The rear third was braced against the tunnel wall until the cable of the crane was fastened in place. Then the machine relaxed its grip and was hauled out of the hole.

Morris, the owner-operator of a heavy equipment rental company, started development work on the Badger in 1954. He has applied for patents, which are now pending.

Two Contracts

The joint venture has two contracts at Vandenberg. In July, 1958, they were awarded a contract of $2.8 million. By May, 1959, according to the Corps of Engineers estimates, the contract costs had increased to $7.4 million.

This increase resulted from the "concept of concurrency" under which missile facilities are built before the designs are complete. This means continual changes and modifications to the plans during the construction and a great deal of extra work for the contractor.

On the first contract, the joint venture built the personnel tunnels by hand methods and pneumatic tools. They handled mucking with a small Eimco machine loading into a small rubber-tired muck car.

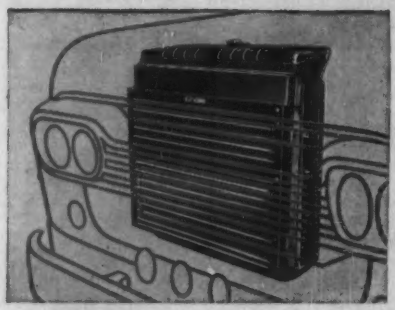
In April, 1959, the joint venture was awarded a $5.9-million second contract for additional Titan facilities at Vandenberg. It was on this contract that they used the Badger.

The Los Angeles District of the Corps of Engineers is acting as contract administrator and construction supervisor. Col. C. T. Newton is district engineer. Lt. Col. Allen W. Sanders, area engineer, is in charge of the Vandenberg construction. Bill Smiddy is project engineer.

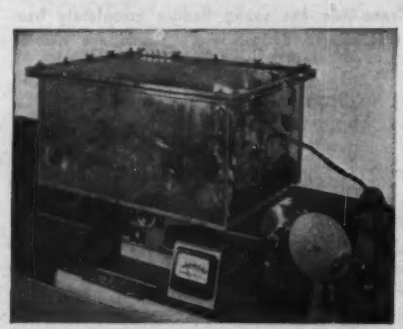
Walter Jarvis is project manager for the joint venture. Ted Prescott is foreman for NorthCal.

OLD METHOD—On first contract, crews drove tunnel by hand methods, using pneumatic tools. For second contract, Badger proved to be a more efficient tunneling method.

NOW! Certified Durability



CLOSER TEMPERATURE CONTROL obtained with automatic radiator shutters means longer engine life, more efficient operation. Temperature variation between 167° and 187° with shutters as compared to 102° to 181° without shutters was reported and certified in loaded vehicle road tests.



LONGER WIRING HARNESS LIFE is the direct result of Ford's greatly improved electrical wiring system for 1960. Ford's '60 wiring harness and the 1959 wiring harness were subjected to shaker table tests plus constant exposure to oil and water vapors, and temperatures of 200°. Certified test results show a threefold increase in 1960 wiring harness life.

INCREASED FUEL PUMP RELIABILITY is an added benefit from Ford's submerged-type electric fuel pump. Certified results of dynamometer tests showed no vapor lock with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under same conditions.

It's a fact! Numerous reports from high-mileage operators of Super Duty Trucks attest to Ford's outstanding durability. Studies by an independent research firm provide certified proof that these models are even more durable for 1960.

Ford Super Duty Trucks have earned a reputation for exceptional performance and durability since their introduction two years ago. Shop service records of many leading fleets show Super Duty tractors with mileage readings between 150,000 and 250,000 and no repairs other than normal maintenance. Similar testimony to the dependability of these Big V's by other satisfied users is being added each month. Is it any wonder that '59 sales of these units were more than double those of 1958?

And for 1960, the Ford Super Duties offer additional refinements. Bigger optional axles and increased GVW's to permit greater payloads and more profitable operation. Automatic radiator shutters to keep the engine temperatures within the most efficient operating range, improved submerged-type electric fuel pumps to prevent vapor lock, and redesigned wiring for more reliable operation are typical of the improvements to be found in these units.

The changes offered for 1960 were tested and evaluated by a leading research organization. Certified results of the studies by this impartial firm (name available on request) provide proof that Ford's Super Duty Trucks are even more dependable.

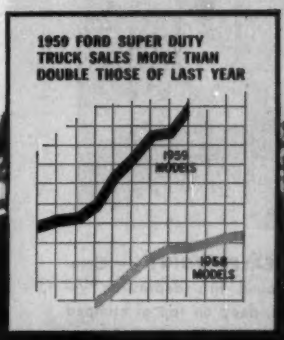
- **Certified Durability through closer temperature control!** Independent research engineers certify that Ford's thermostatically controlled radiator shutters kept water temperature between 167° and 187° in severe mountain grade operation. The test truck with shutters blocked open under same operating conditions had a temperature range from 102° to 181°. The temperature variation of only 20° with shutters means less expansion and contraction in block and heads. Higher, more constant temperatures permit oil to circulate more freely, reducing internal friction. All these factors contribute to longer engine life.

- **Certified Reliability with longer-lived electrical system!** Thicker insulation on wires resists deterioration by heat, oil and gasoline. Asphalt-impregnated loom and plastic-coated mounting clips protect against abrasion. Certified results prove that the 1960 wiring harness has three times longer life.

- **Certified Reliability with Ford's submerged-type electric fuel pump!** Dynamometer tests of engines with submerged-type electric fuel pump and conventional mechanical type showed that vapor lock was non-existent with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical pump resulted in a power loss of 9% at an underhood temperature of 200°.

Endurance tests were run on alternators, two-speed axle speedometer adapters and other related components with similar results. Get all the facts at your Ford Dealer's now!

in Ford Super Duties!



"Our first Ford C-1000 tractor has logged 190,000 trouble-free miles since March of '58,"

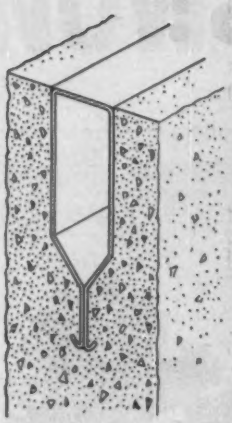
says Robey W. Estes, Vice President and General Manager of Estes Express Lines, Richmond, Va. "We haven't had a single road failure and we only bring it into the shop for regular preventive maintenance work once a month.

"We use the 477 engine and find oil consumption is exceedingly low . . . only one or two quarts added between 3000-mile oil changes. Engine compression at 190,000 miles is still high and fairly equal and our drivers say that power and pep are at about the same level as when the truck had been run only 60,000 miles.

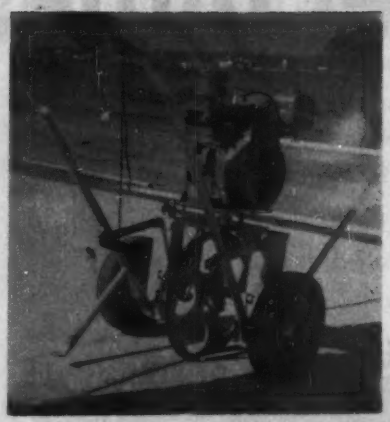
"We are grossing between 52 and 56,800 pounds with our Ford Tilts. They are giving about the same gas economy and better oil mileage than other makes in our fleet. We bought our fourth Ford C-1000 tractor last month and hope to add more soon."

FORD TRUCKS COST LESS

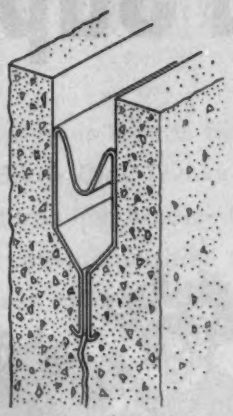
LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!



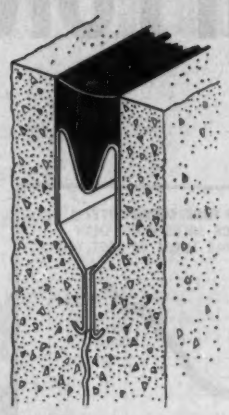
INSERTION — Drawing shows how Unitube, metal joint-former, appears after it is placed in concrete.



CRIMPING—Operator of hand rig crimps the flat top part of Unitube joint with steel wheel mounted between rubber tires. Unitube is crimped after the concrete cures.



CONTRACTION—Unitube spreads as fracture widens. Hooks at bottom anchor it solidly in the concrete.



SEALED JOINT — Compound fills depression ½-in. deep on top of crimped Unitube. This is last step.

Steel Tubes Form Road Joints

THERE'S NO TELLING how many blades a contractor might wear out trying to saw contraction joints in the hard aggregate specified for U.S. 29 northeast of Washington, D.C. Wright Contracting Co., Columbus, Ga., eliminated sawing completely with a thin strip of sheet metal that makes joints in plastic concrete.

Wright is placing reinforced concrete 9 in. thick at the rate of 1,800 ft per day along a 3.72-mi section of the four-lane highway. The design calls for twin 25-ft slabs divided by longitudinal joints into 12- and 13-ft lanes.

Installing Unitube

The only poser on the job is the hard gravel of glacial origin specified for the aggregate. The gravel ranges in size up to 2 in. and is so hard it can ruin saw blades in two passes. And it often causes ragged joint edges. Laboratory tests conducted by Maryland indicate that the gravel is harder than most types found elsewhere in the United States. For this reason, Maryland highway engineers have been looking for a way to eliminate sawed joints.

Wright seems to have found the answer with Unitube, a tubular steel joint-former. They install Unitube joints with a special rig that rides the forms, keeping pace with the paving train.

In section, Unitube is the shape of a pop bottle turned upside down. It is 3 in. deep and measures 5/16 in. at its widest part across the top. The top part contains foamed plastic to help it keep its shape during installation. Its tapering sides come down to a point and then curve outward. This hook-like curvature anchors Unitube in the concrete.

Wright inserts Unitube with a special jointer that follows the screeds and precedes the floats in the paving train. Middlestadt Engineering Co., Baltimore, manufactures both Unitube and the jointer.

The jointer consists of a welded-steel frame that can be adjusted to straddle the width of the pavement. It is powered by electric motors, fed by a 6-hp diesel generator mounted on the frame.

Across the end of the frame, there is a steel bar with a slot down the center to serve as a guide for the insertion of transverse joints. To make the joint, workmen align the jointer so that the slot is in the proper position over the freshly poured concrete. Then they insert a T-bar through the slot. The T-bar, vibrated by two electric motors and controlled by automatic hand-set stops, works itself into the concrete to form a preliminary groove for Unitube.

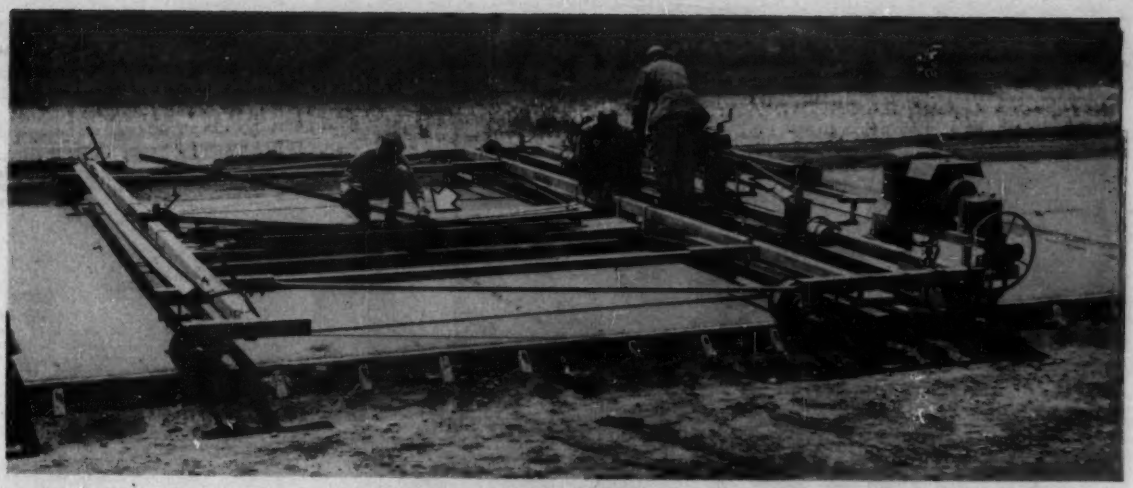
Next, they remove the T-bar and place a 25-ft length of Unitube through the slot by hand. They insert the T-bar again on top of Unitube to vibrate it into place until its wide top part is flush with the top of the pavement.

Longitudinal Joints

Running through the center of the frame is another steel bar with a slot down the center to act as a guide for the insertion of longitudinal joints. The preliminary groove for the longitudinal joint is made by a sharp blade shaped like the point of a ski. The blade floats in front of the steel bar and cuts the groove as the jointer advances on the forms. A length of Unitube is placed through the longitudinal slot and vibrated into place.

Floats that follow the jointer usually cover the joint with a thin surface grout. The contraction fracture usually appears within 24 hr.

After the concrete sets, Wright crimps the flat top of the Unitube with a hand operated machine that consists of a narrow steel wheel, mounted between two



THE JOINTER—It takes three men to operate this self-propelled rig that rides the forms, keeping pace with the paving train. Machine sets both longitudinal and transverse joints. Workman is installing a longitudinal strip of Unitube (arrow) into concrete.

rubber tires. The steel wheel applies enough pressure to cave in the top of the Unitube, leaving a depression about ½ in. deep that is filled with jointing compound.

With the jointing problem licked, Wright had little trouble with the rest of the paving sequence. There is no traffic to interfere with heavy equipment. There are no grade crossings, slopes, or sudden curves. And the structures were placed by another contractor before Wright began.

Paving Operations

The pavement lies on a 6-in. select gravel base. A subgrader vibrates and tamps the base material and shaves off irregularities. A 5-ton Ingram Road Roller follows the subgrader to make the final compaction pass.

The paving train consists of two Rex dual-drum pavers. A Blaw - Knox spreader follows each paver, placing concrete in 4½-in. lifts. Workmen spread reinforcing wire mesh after the first spreader.

A Koehring screed follows the second spreader. The jointer, floats, and burlap drag come next.

Wright erected a batch plant about midway along the project in an area that will become a part of a cloverleaf interchange. Six-ton batch trucks haul along the right-of-way.

Men on the Job

E. H. Tate is project superintendent, and William Kirk is project manager for Wright. W. H. Miller is resident engineer for the Maryland State Highway Department.

INSTALLATION—Workman inserts Unitube through slot in steel bar that serves as guide for longitudinal joint. Electric motor mounted on bar vibrates Unitube into place.

PAVING—Rex dual-drum paver dumps concrete in front of Blaw-Knox spreader for first lift of 4½ in. Before placing next lift, workmen will spread wire mesh reinforcing.

Exclusive WALKING BEAM action....

WALKING BEAM in "semi-locked" position. Lead guide roll can rise above but not go below its normal position.

LEAD GUIDE ROLL encounters high spot. This light pass exerts only normal pressure . . . "prepares" the material.

CENTER GUIDE ROLL rides the hump with all its weight, plus weight of lead guide roll, and some of the drive roll weight . . . nearly triples normal compaction weight at this point.

DRIVE ROLL follows through with normal pressure as it passes over. (Notice, lead roll doesn't "dent" surface.)

irons out the high spots...*without cross-rolling*

Time is a key factor on asphalt paving jobs. *Finish*-rolling should be done while materials are pliant and workable. Otherwise, when waves or humps have to be smoothed out later by cross-rolling, materials have already set. This can cause serious *internal* damage to the material and hasten deterioration under traffic. To overcome this problem, Buffalo-Springfield® brings you *complete compaction control* in a 3-axle tandem that eliminates cross-rolling on city streets (above), highways, airports.

This variable-weight, 13-20 ton roller, with its unique "Walking-Beam" action, applies extra pressure where and when needed . . . *on the high spots only.* Produces a smooth, well-compacted surface during the important *initial* leveling period . . . does it in fewer passes, too! In fact, performance reports show that it compacts 60% more tonnage per day than a standard 2-axle tandem working on the same type surface. "Walking-Beam" may be semi-locked, fully-locked at any time . . . or completely unlocked to roll vertical curves, warped surfaces. *What's more,* hydraulic power raises the lead guide roll, or center guide roll, to operate this Buffalo-Springfield roller as a *short-* or *long*-wheelbase 13-20 ton 2-axle tandem. *More* versatility is shown below.

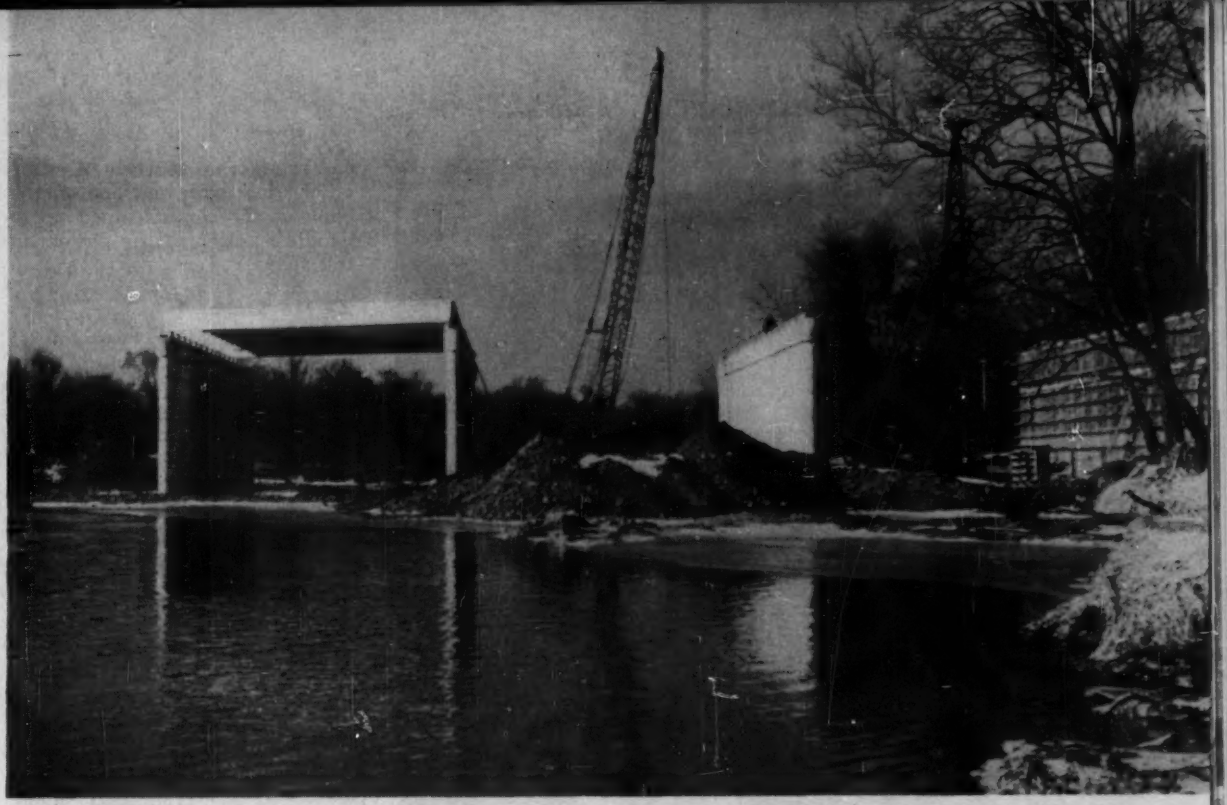
3-WAY COMPACTION IN ONE PASS ▶

Equipped with segmented lead roll, vibratory center roll, and smooth-faced drive roll, this same 3-axle tandem delivers a 3-way "punch" that can mean additional savings on your work. There's no other 3-axle tandem on the market that offers you so much versatility for your money. Why don't you look into it today? Call Buffalo-Springfield distributor, or write us.

B902

BUFFALO-SPRINGFIELD CO. SPRINGFIELD, OHIO Division of Koehring Co.

PNEUMATIC TIRE • VIBRATORY • SEGMENTED ROLLERS • 2 AND 3-AXLE TANDEMS • 3-WHEEL ROLLERS • KOMPACTOR®



HOLDS BACK RIVER—Earth dike extending half-way across river encloses two piers. After building these piers and erecting girders, contractor built dike on other side for third river pier. To bring in girders for this span, trucks must ford river.

Cranes Erect Water-Span Girders

The big problem facing the contractor building these two viaducts was how to get cranes into position to erect the heavy prestressed girders.

By WILLIAM B. PETO
General Superintendent
Franklin Contracting Co.
Little Falls, N. J.

THIS JOB we're winding up now involves building two prestressed concrete viaducts, one at each end of a 2-mi section of a new interstate highway that cut across a bend in the Raritan River south of Bound Brook, N. J. Besides spanning the river, which is about 300 ft wide in most places, the viaducts will carry the highway over an abandoned barge canal alongside the river, some railroad tracks, and a road. The viaduct at the west end is 1,367 ft long; the one at the east end, 800 ft.

A couple years from now, when I think back about building these two structures, I'm sure I'll recall as the high spot how we worked out a plan to get equipment into position to erect the prestressed girders. They vary in length from 72 to 90 ft and weigh up to 40 tons.

Canal Complicates Access

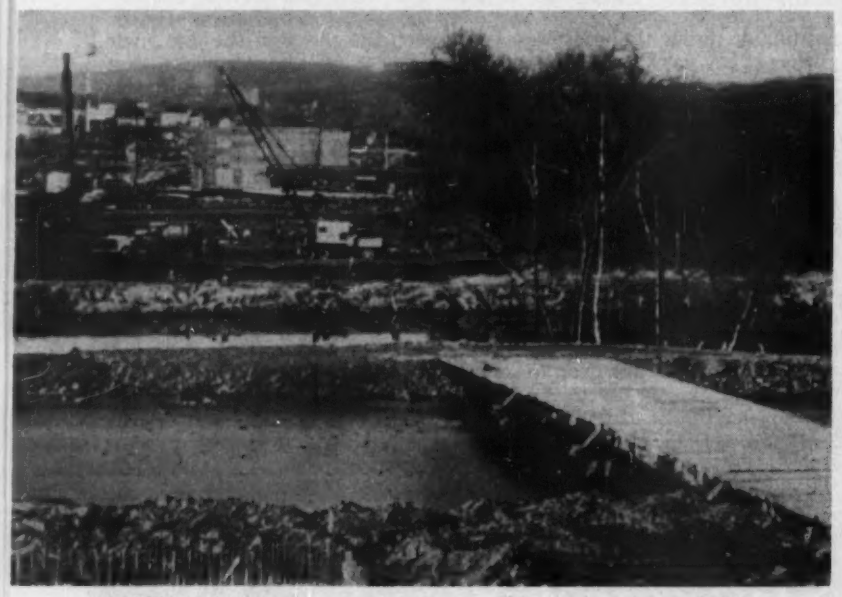
To avoid interference with deck forming and pouring, we wanted to erect all spans from below, instead of working out from each end on top. But access on one side of the river was cut off by the canal. It's separated from the river by an 18-ft-wide tow path, and there's an abrupt drop of 20 ft from the top of the tow path to the river.

So we had to erect all three river spans from the other bank. We built an earth dike halfway across the river on that side to enclose two of the piers. After dewatering inside the dike, we built these two piers in the dry and erected the girders with a crane walking back and forth between the piers on the dry river bottom. The trailer trucks that hauled the girders to the site traveled on top of the earth dike to get within reach of the crane.

Then we switched the dike to the other side of the stream and built the third river pier. To bring in the girders for this span, we had to ford the river. Fortunately it's not more than 5 or 6 ft deep, except after heavy rains. We built a gravel-run road across the river. Depth of water over the road was only about 18 in. With a little help from an International TD-24 dozer, the trailer trucks negotiated the crossing without trouble.

As for the span crossing the canal, we built a temporary bridge across the canal to get our equipment on the tow path. Working from there, we put in a cofferdam for the canal pier, blasted out the rock foundation,

ERECTING GIRDERS—Manitowoc crane with 110-ft boom places girders for river spans enclosed by earth dike. Girders vary in length from 72 to 90 ft, weigh up to 40 tons.



CROSSING CANAL—Temporary bridge spans 90 ft across canal to 18-ft-wide tow path alongside river. It carries equipment into position to work on cofferdam for pier in canal

and brought up concrete. A crane on the tow path and one on the bank of the canal teamed up to handle erection of the girders in this span.

At the Start

First step when we started work on the viaducts was to build the dike enclosing the two river piers on the side opposite the canal. Trucks end-dumped material and dozers pushed it out into the river, step by step, until the dike encircled the entire pier area. The completed dike was about 6 ft above normal river level.

Dewatering took about 15 hr with three 6-in. Marlow centrifugal pumps, each with a capacity of 90,000 gpm. Later two 3-in. pumps of the same make were enough to handle seepage through the earth walls.

Several flash floods topped the dike during construction of the piers. The biggest occurred when a dam a few miles upstream broke after a heavy rain. The river rose 12 ft in 10 hr. One of our cranes was caught inside the dike at the time, but it suffered no damage. With boulders, we patched holes ripped in the dike by the flood.

To excavate the pier foundations, we blasted 9 ft into the rock below river bottom. An Ingersoll-Rand Wagonmaster with two jibs drilled 2½-in. holes in a staggered 3x5-ft pattern. We shot with about two sticks of dynamite per hole.

Bridges Span Canal

In the meantime, on the other side, we were building the temporary bridges across the canal so that we could start work on those piers. For the longer one at the west end, where the canal is 90 ft wide, we placed three wood-pile bents to carry five rows of WF beams. We lapped two 62-ft-long sections to span the bents. On top of the beams we added a 24-ft-wide timber deck to complete the superstructure of the bridge

At the other viaduct the canal is only 21 ft wide at one of the old locks. Here a timber trestle with 16x16-in. stringers and a 4-in. oak plank deck did the job.

We were then able to get a crane across the canal onto the tow path at each viaduct and in-

stall a sheetpile cofferdam for each canal pier. Depth of the cofferdams was about 24 ft. Size of the two on the east viaduct was 14x140 ft; the one at the west viaduct was 14x98 ft.

Excavation in each cofferdam went about 8 ft below the toe of the sheeting, which was driven into hard shale. To prevent damage to the cofferdam during blasting, we kept the outer rows of bore holes at least 2 ft away from the sheeting. But the big worry was the possibility of blowing a break in the tow-path dike, only a few feet away. To minimize this danger we divided each shot into light sections with delays.

Pier Form Panels Are Big

Forming and concreting the piers went fast once the footings were in. We used king-size 24x42-ft panels, each weighing about 5 tons, to form the sides of the piers. Length of the 3-ft-thick piers varied from 95 ft on the west viaduct to 136 ft on the east. We used as many as six of the panels to form one side of a pier.

We built the panels at the job site, using ¾-in. plywood backed with 3x6 studs on 1-ft centers and braced with double 3x6 walers spaced at 3-ft intervals. Richmond ties rated at 12,000 lb each held the panels. We designed the forms to withstand a liquid head of 10 ft.

Erection of forms for a pier took 3 days on the average. To help align panels during erection, we guyed them with ⅜-in. cables.

The job calls for a total of 26,000 yd of cast-in-place concrete. Each pier requires about 650 yd. We brought up concrete the full 40-ft height in just 5 hr, using a Lorain truck crane with 1½-yd laydown bucket.

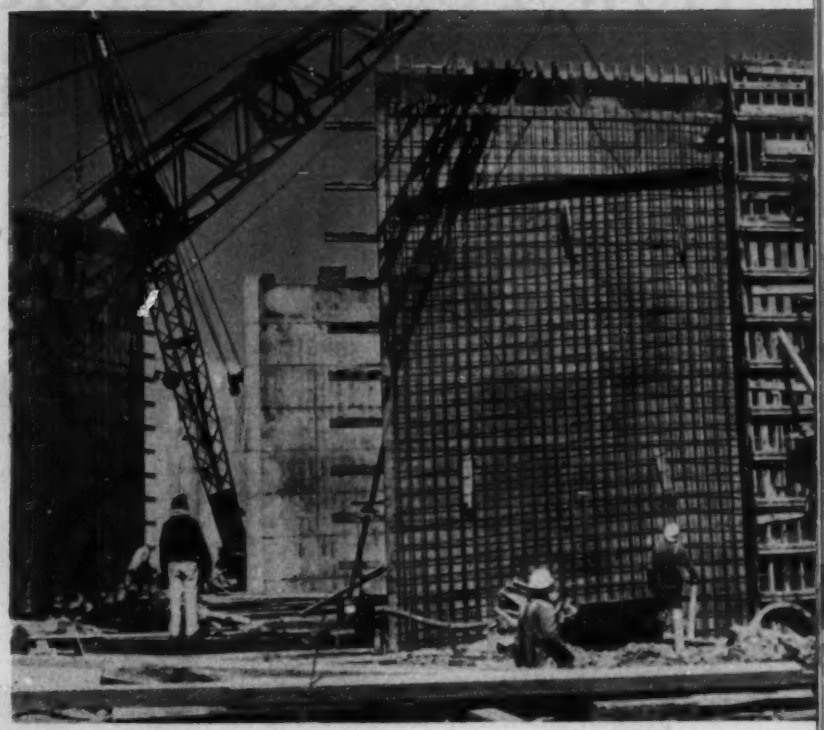
Trailer trucks hauled the prestressed concrete girders to the job from the Atlantic Prestressed Co. plant in Trenton, where they were cast. They brought in about 11 per day when erection was in full swing. Working singly and sometimes together, two Manitowoc 5400 cranes with 110-ft booms handled erection.

Concreting the Deck

Erection is now complete, but we've still got some deck slab to pour to wind up the job. We're using trussed steel Spanall joists between girders to hold the ¾-in. plywood sheeting. We keep two sizes on hand: one is adjustable in length from 6 to 9 ft, the other spans 3 to 5½ ft. Space between the trussed steel joists averages 2 ft.

We place concrete for the 8-in.-thick deck slab with a crane. The crew levels it by hand with a 14-ft-long screed.

The job is approaching completion now, well ahead of schedule. Men on the job for Franklin Contracting Co., besides myself, include Superintendent Bill Dunn, Field Engineer Joe Armstrong, and Lou Ley, who is office manager. Resident engineer for the New Jersey Highway Dept. is Art Ackerman.



ERECTING FORMS—Cranes place 24x42-ft reintorcing mats and panel form for piers. Faced with ¾-in. plywood backed by 3x6 studs and double 3x6 walers, panels weigh 5 tons.

BLASTING FOUNDATIONS—Twin jibs mounted with a compressor on back of truck drill 2½-in. holes in staggered 3x5-ft pattern for blasting 9 ft into rock below river bed.

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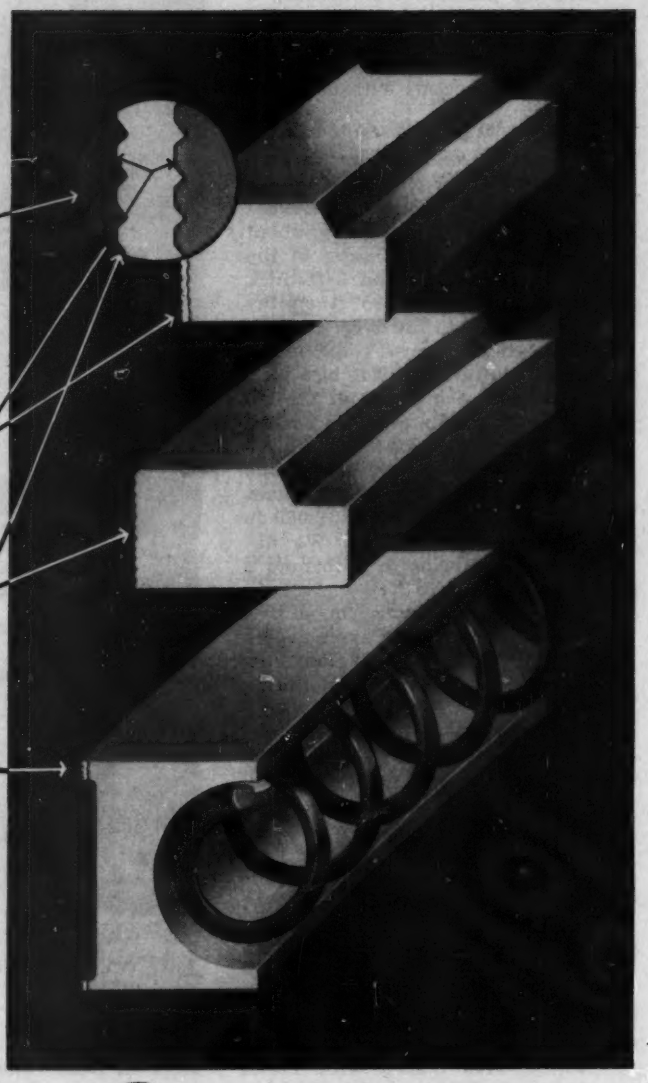

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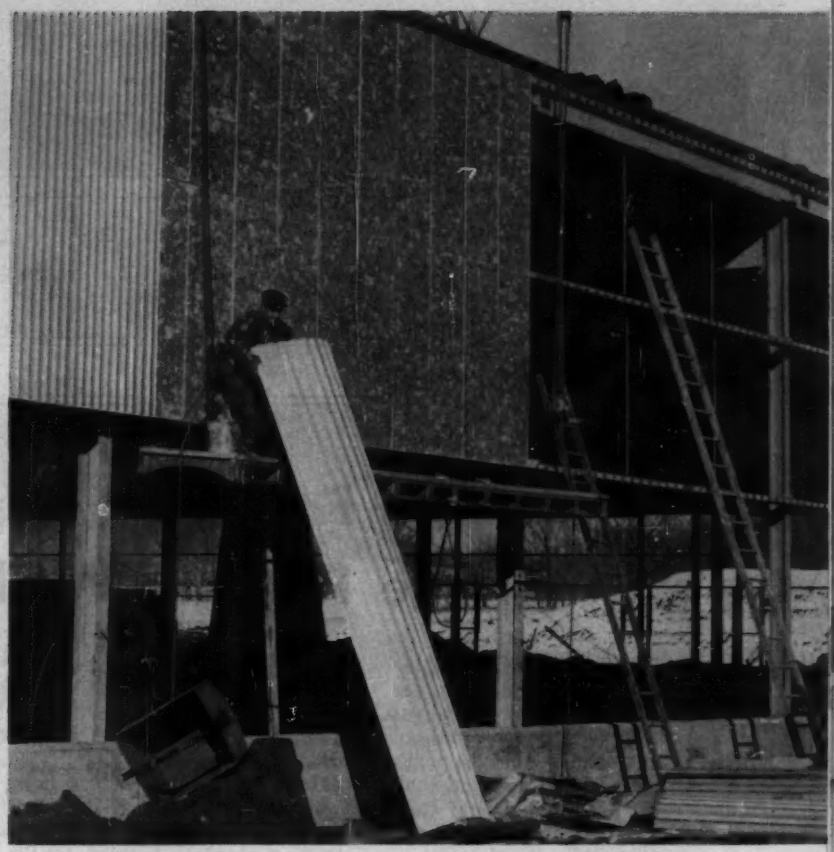
STUD WELDING — Workman end-welds studs to girts with Nelson welding gun.

IMPALING BATTENS—Workmen, with rubber-end hammers, impale T-bars on studs.

SECURING WALL—Aluminum caps, set on ends of studs, hold wall firmly in place.



WALL ASSEMBLY—Workman has little trouble lifting lightweight aluminum sheeting to scaffold. Next, he will impale it on studs over Fiberglas insulation already in place.

Quick Way to Assemble Curtain Wall in Place

ASSEMBLING a curtain wall in place on end-welded studs cut the cost of enclosing a large warehouse in East Hartford, Conn. The contractor impaled the components of the curtain wall—in this case battens, insulation, and aluminum sheeting—on the studs.

Donovan Erection Co. of Hillsdale, N.J., end-welded approximately 13,000 Nelson Setlok studs on 8-in. centers to girts with Nelson NS-10 stud welding guns. The studs were 5/16 in. in dia and 1¼ in. long.

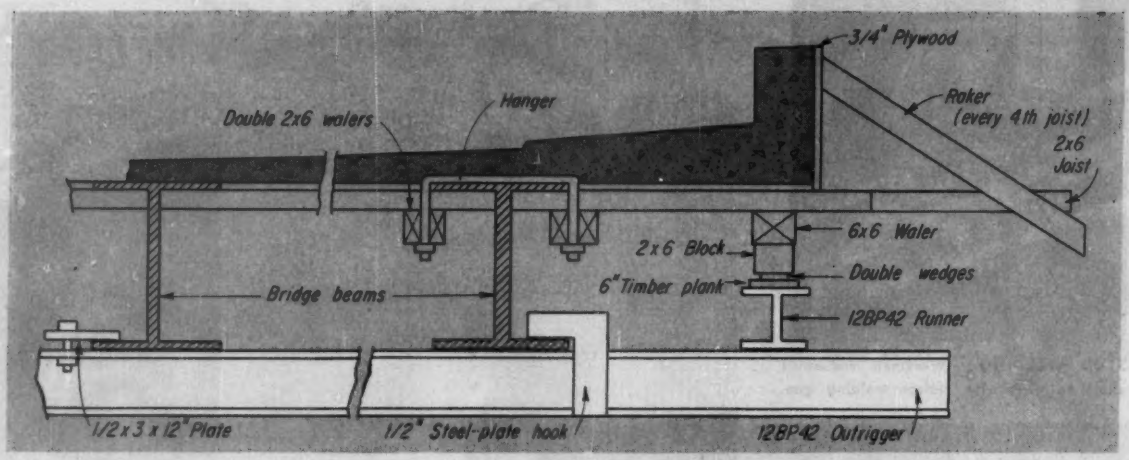
Then, Donovan's crew impaled galvanized impalable T-bar battens on the studs at 24-in. centers with a rubber-end hammer. Each vertical T-bar is 16 ft long and spans three horizontal girts.

Next, workmen fitted 1-in. Fiberglas insulation sheets between the T-bars, pressed them down over the studs, and secured them with speed clips. The insulation sheets were painted at the factory on the inside surface. They will form the interior wall of the warehouse without further treatment.

Finally, ribbed aluminum 0.032 in. thick were impaled on the studs with the rubber-end hammer. Aluminum Setlok caps on the protruding portion of the studs hold all elements of the wall firmly in place.

The warehouse is 960 ft long, 300 ft wide, and 20 ft high; it has a total of 28,000 sq ft of wall space. It was built for the Fuller Brush Co.

Walter Kidde Constructors, Inc., of New York was the general contractor.



Simple Falsework Suppports Bridge Parapet Wall Forms

HERE'S a simple, sturdy falsework system to support parapet wall forms on highway bridges of conventional steel beam design.

Outriggers suspended beneath the bridge beams project on each side of the bridge and hold steel runners that are centered under the parapet walls. Timber falsework on top of the runners supports the forms.

Both outriggers and runners are 12BP42 sections. Spacing of the 14-ft-long outriggers is 15 ft. They extend about 4 ft beyond the outside bridge beams. At the other end there is an extra 2 ft protruding beyond the interior bridge beams.

How are the outriggers hung from the bridge beams? A pair of L-shaped hooks made of ½-in.-thick steel plate welded to the sides of the outrigger slips over the bottom flange of the exterior bridge beam. At the other end, a steel plate fits over the bottom flange of the interior bridge beam. There are several rows of holes in the top flange of the outrigger so the steel plate can be bolted to hold the outrigger tight against the beam.

A crane handles erection from the top; a two-man crew works below. One man guides the outrigger into place from the outer end, slipping the hooks over the bottom flange of the exterior bridge beam. The other man at the inner end then bolts the steel plate, clamping the outrigger to the interior bridge beam.

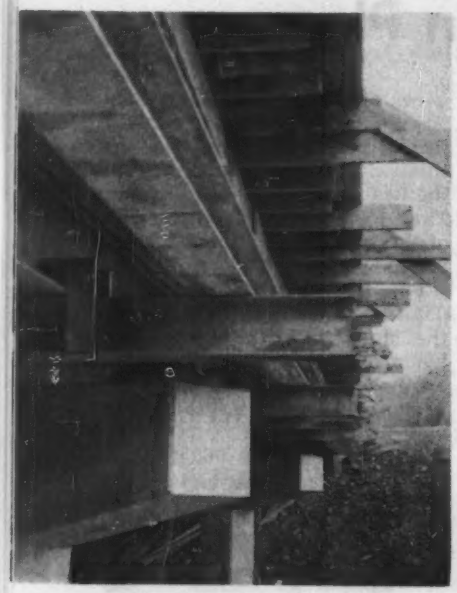
When all outriggers are in place, the crane places the 40-ft sections of steel runner along both sides of the bridge. It takes only about 2 hr for an experienced crew to put up the steel for the falsework system.

Then carpenters take over to build the timber falsework and forms. First they place a 6-in.-wide plank on the top flange of the runner and space 2x6 blocks at 3-ft intervals. Double wood wedges at the base of the blocks permit aligning the 6x6 waler on top to conform with the desired deck camber. The waler carries 2x6 joists, spaced at 16-in. centers, that hold the ¾-in. plywood forming the bottom of the parapet. A double 2x6 waler hung from the top flange of the exterior bridge beam by a Richmond hanger supports the inner ends of the joists. Every fourth joist extends 4 ft beyond the others to hold a raker that braces the parapet wall forms.

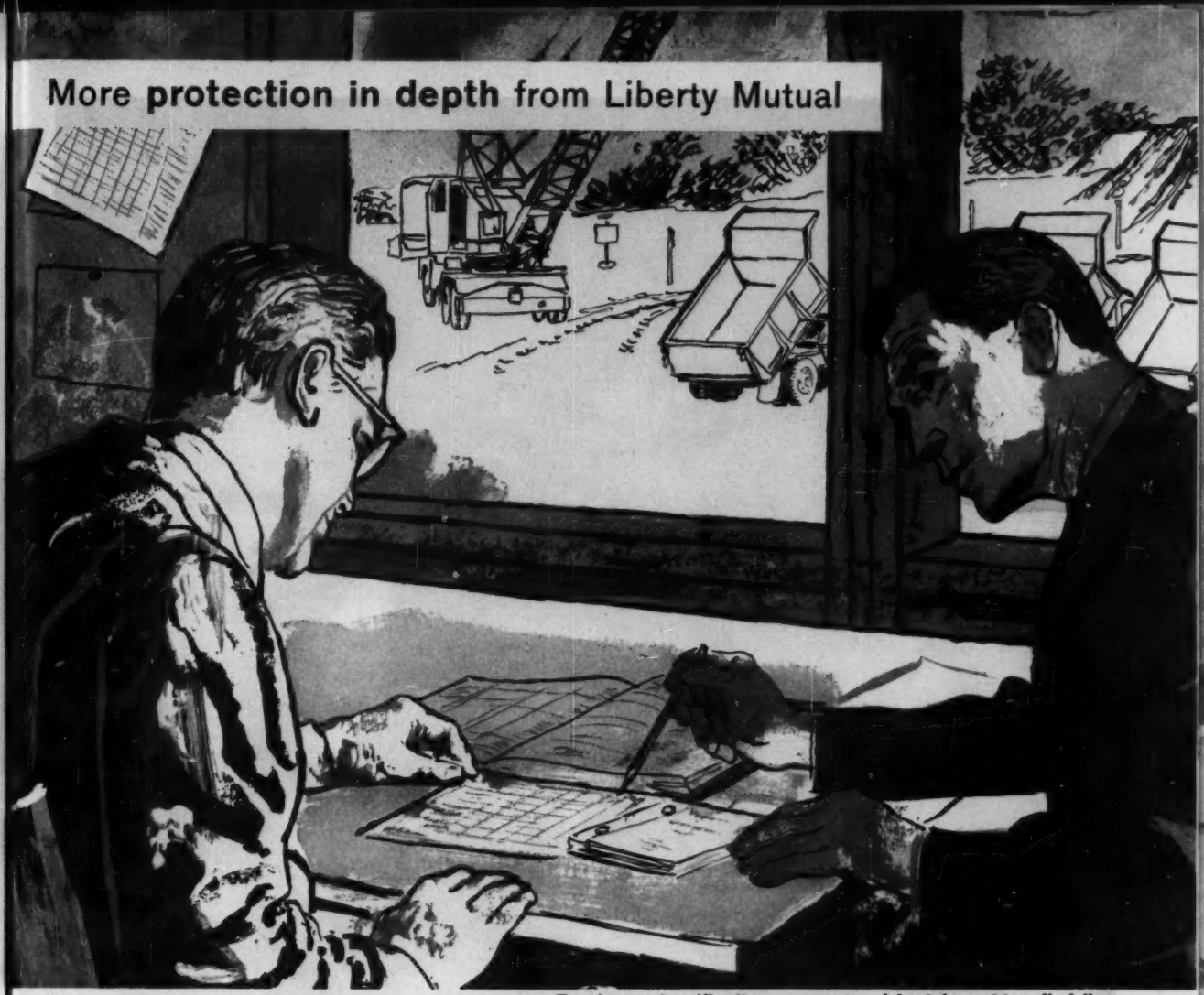
Credit for devising the system goes to Edward Swartz, bridge superintendent for H. J. Williams, Inc., York, Pa. They used it for the first time for the bridges on their section of the Penn-Can Highway north of Scranton, Pa.

They're pleased with the way the system worked out, but they already have some ideas on how to improve it. For one thing, if they had it to do over again, they'd use lighter beams instead of the husky H-pile sections that were left over from another job. The extra thickness of the flanges of the H-pile sections adds needless weight; it's the web that carries the load. They figure two men could handle the lightweight steel members without a crane.

And next time they'll cut the runners into shorter sections, about 16 ft long, to span between outriggers, where they will overlap. That will make them easy to handle, too, and do away with the need for a long flat-bed truck to haul them from bridge to bridge.



BENEATH BEAMS—Hooks welded to outrigger fit over flange of bridge beam.



Employee classifications are reviewed by Liberty Mutual's full-time auditors. This procedure can save policyholder premium, make payroll distribution more accurate and easier to handle.

How Liberty's auditing service helps lower your workmen's compensation costs

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ACCOUNTING FOR CONTRACTORS

The second part of a new booklet published by the American Instiute of Certified Public Accountants, reprinted here, discusses two areas of accounting important to contractors.

Working Capital

In August, 1947, at the time of issue of Accounting Research Bulletin No. 30 on "Working Capital" (now restated as Chapter 3 of Bulletin No. 43), the Institute committee observed: (1) that considerable variation and inconsistency existed with respect to the classification and display of current assets and liabilities in financial statements; (2) that previous definitions of current assets have tended to be overly concerned with whether such assets were immediately realizable; and (3) that creditors and others tended to rely more on the ability of debtors to pay obligations out of proceeds from current operations and less on the debtor's ability to pay in case of liquidation.

Financial statements of contractors are prepared on the "going concern" basis on the assumption that a company will continue in business. Usually, the certified public accountant's opinion is based on the same assumption. With this in mind the Institute committee on accounting procedure departed from a narrow definition or strict one-year interpretation of either current assets or liabilities and related the criteria of determining current assets or liabilities to the operating cycle of the business involved.

The committee described its concept of the operating cycle as follows:

> The ordinary operations of a business involve a circulation of capital within the current asset group. Cash is expended for materials, . . . labor and . . . services, and such expenditures are accumulated as . . . costs. These costs . . . are converted into . . . receivables and ultimately into cash again. The average time intervening between the acquisition of materials or services entering this process and the final cash realization constitutes an operating cycle. A one-year time period is to be used as a basis for the segregation of current assets in cases where there are several operating cycles occurring within a year. However, where the period of the operating cycle is more than twelve months, as in the tobacco, distillery, and lumber businesses, the longer period should be used. Where a particular business has no clearly defined operating cycle, the one-year rule should govern. The term current liabilities is used principally to designate obligations whose liquidation is reasonably expected to require the use of existing resources properly classifiable as current assets, or the creation of other current liabilities.

With the above concept still in mind the Institute issued, in late 1955, Bulletin No. 45. In this bulletin, in discussing both the percentage - of - completion and the completed-contract methods, they suggested that amounts of costs, billings and income be included in either current assets or current liabilities.

Illustration: A moderate-sized plumbing contractor normally engaged in residential construction and repair work (for which the contracts are usually of only several months duration) would normally, since "there are several operating cycles occurring within a year," classify his costs and billings as current assets and liabilities under the one-year rule.

However, if he were functioning as a subcontractor for a large housing development, which might take several years to complete, the retainage would properly be excludable from the current assets of the plumbing contractor until its collection could be expected within a one-year period. In contrast, the liability to the subcontractor for the retainage would be properly classifiable by the general contractor as a current liability if that contractor had a normal business cycle of several years duration.

Observance of the philosophy or concept of this bulletin will be seen in the published financial statements of large contractors employed on such long-term projects as electric generating station construction. Because such contracts have a normal long-term business cycle, their costs and billings are properly classifiable as current assets or current liabilities.

Judgment must be exercised to determine, based on the nature of the business of the contractor, what the period of his normal operating cycle is. Where the contractor tends to specialize in a certain type of project his normal business cycle is likely to be clearly defined. On the other hand, where his business is diverse and the period for completion varies markedly, it would appear that the longest period representing a substantial portion of the business would represent the normal operating cycle and all contracts with lesser periods would also fall within the working capital classification.

Questions are sometimes raised about such items as the cash surrender value of life insurance. Why isn't it normally shown as a current asset? Such insurance is not purchased by a company with the idea of cashing it in when the company requires working capital, and it may therefore be considered comparable to any other

noncurrent asset which a company has no intention of selling, but which may be pledged as collateral for a loan. The term current assets then is used to designate cash and other assets or resources commonly identified as those which are reasonably expected to be realized in cash, or sold, or consumed during the normal operating cycle of a business. When there are reasonable doubts as to the collectibility of any items in the ordinary operating cycle of a business, such items should be excluded from the current asset category.

Occasionally, the question also arises as to whether a contractor's investment in a joint venture is a current asset. Generally speaking (as each situation should be judged on the facts of its circumstances) such an investment would be classifiable as a current asset if and to the extent that the underlying assets of the venture were classed as current in the statements applicable to the venture. If the operating cycle of the venture does not parallel that of contractor investor, that fact should be disclosed.

Sometimes it is argued that, under the completed - contract method, the excess of billings over related costs should not be shown as a current liability because, at least in part, it represents income to the contractor, but should be shown as deferred income. The committee suggested, in recommending the selection of a method, that the completed-contract method was preferable only when dependable estimates of total costs were lacking or when inherent hazards caused forecasts of total costs to be doubtful. When a contractor has adopted the completed-contract method because of a lack of dependable estimates or inherent hazards, he can hardly argue in advance of substantial completion of a contract that "X dollars" represents profit earned to date or deferred income.

In discussing the completed-contract method earlier in this booklet, it has been noted that income should be recognized on substantial completion of a contract. In such circumstances obviously the recording of deferred income in the balance sheet would be improper. It must be recognized also that while a project is in process, a portion or all of the excess of billings over related costs may represent advance payments by the contractor's client. The most practical and conservative solution, therefore, is to treat such items as liabilities, in most cases as current liabilities, until the income on the contract has been proved to be realized by substantial completion thereof.

Contractor's Equipment

Contractors either own or rent heavy equipment such as trucks, graders, concrete mixers, scrapers, cranes, power shovels, derricks, air compressors, rock drills, pumps, etc.

When heavy equipment is rented, the accounting is comparatively simple. The cost of such

equipment is allocated to the particular jobs where it is used on some reasonable basis such as time, mileage, etc. Substantial rental commitments should be disclosed in footnotes to a contractor's financial statements. When rented equipment is owned by an affiliate the rental costs should be separately disclosed and identified. Intercompany profits from such rentals should, of course, be eliminated in the preparation of consolidated financial statements.

Vendors of contracting equipment sometimes lease their equipment to contractors with an option to purchase at a later date. Such arrangements must be clearly distinguishable from a conditional or outright sale.

Purchase option rentals offer the advantages of immediate rental deductions for tax purposes (which can be larger than depreciation allowances), smaller immediate outlay of funds, and an opportunity to evaluate the equipment under operating conditions. Rental amounts paid by the contractor lessee should be recorded as jobs costs or expenses. The net amount paid (that is gross price for the equipment less rentals allowed against that price) should, on exercise of the purchase option, be capitalized and depreciated over the remaining useful life of the equipment.

Under some circumstances a lease arrangement may represent no more than an installment purchase of the equipment. This may be the case:

1. When the lease is made subject to the purchase of the equipment for a nominal sum or for an amount obviously much less than its fair value at the time of purchase.
2. When the lease agreement stipulates that the rentals may be applied in part as installments on the purchase price of the equipment.
3. When the rentals obviously are not comparable with other rentals for similar equipment so as to create the presumption that portions of such rentals are partial payments under a purchase plan.

In the above circumstances, it should not be assumed necessarily that just because the lessee does not have legal title to the property and does not assume any direct mortgage obligation that it would be improper to include the equipment among the contractor's assets and to show the related indebtedness as a liability.

The underlying facts relating to all leases should be very carefully considered, and where it is clearly evident that the transaction is in substance a purchase, the leased equipment should be included among the assets of the contractor-lessee with suitable accounting for the corresponding liability and for the related depreciation and interest charges in the contractor's income statement.

Owned fixed assets of contractors are usually recorded at cost and classified into three general categories: (1) heavy machinery and equipment, (2) miscellaneous tools and equipment, and (3) trucks and autos.

continued on next page

When the operating costs of equipment are substantial in amount, it is essential for the contractor to maintain an equipment operating cost ledger. This record not only supplies information as to the location of the equipment but more importantly serves as a basis for allocation of costs to specific jobs and by comparisons between similar equipment provides information as to relative efficiency and economy of the equipment.

Most contractors establish a unit cost of operation for pieces of equipment and charge the jobs at these rates. Operating and maintenance costs of miscellaneous small tools and equipment are usually charged to overhead accounts rather than specific jobs. However a contractor may allocate such costs directly to specific jobs when costs relate to such jobs.

In establishing operating unit costs for equipment, it is appropriate for contractors to apply rates arrived at under the so-called "use rate" theory. In applying this theory, the following factors must be considered: (1) the cost of the equipment, less estimates of its salvage value, or its rental cost if it is not owned equipment, (2) the probable life of the equipment, (3) the average idle time during the life or period of hire of the equipment, and (4) the costs of operating the equipment—such as repairs, storage, insurance, taxes, etc.

From these factors, rates per hour, day or week, etc., may be arrived at, which, based on the reported use of the equipment, will serve as a basis for charging the jobs on which the equipment is being used.

The word *depreciation* is an outstanding example of a term which has a specialized meaning in its accounting senses, and has other meanings to engineers and economists as well as in common English usage. The Institute committee on terminology recognized the obligation of the accounting profession to clarify the meaning of this word as used in the art of accounting. After long consideration this committee formulated the following definition and comments which were issued as Bulletin No. 20 in November, 1943, (later reconfirmed and reissued in August, 1953, together with other definitions as Terminology Bulletin No. 1):

> **Depreciation accounting is a system of accounting which aims to distribute the cost or other basic value of tangible capital assets, less salvage (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation not of valuation. Depreciation for the year is the portion of the total charge under such a system that is allocated to the year. Although the allocation may properly take into account occurrences during the year, it is not intended to be a measurement of the effect of all such occurrences.**

Reference to and careful consideration of the above definition will help resolve depreciation problems in connection with contractor's equipment. Often contractors purchase equipment for a specific job and on completion of that job dispose of the equipment rather than retain it for future work. In these circumstances the useful life of the equipment to the contractor and therefore the accounting period for depreciation allocation is the term of the job—say two years—and not the physical life of the equipment which may be 10 years. The amount to be depreciated should be its total cost less its estimated salvage value at time of disposal.

A number of methods for allocating depreciation have come into use over the years, the most common of which is the so-called straight-line method under which the cost, less salvage value, is equally allocated over the estimated useful life of the equipment. Although such methods as the "declining - balance" and "sum-of-the-years' digits" had a long history of prior use in England and other countries, their specific recognition for income tax purposes in the United States suggested their particular consideration by the accounting profession in this country. The Institute committee on accounting procedure in October, 1954, as Bulletin No. 44 (superseded by a revised Bulletin No. 44 in July 1958) stated that such methods met the defined requirements of being "systematic and rational," and then concluded as follows:

> **In those cases where the expected productivity or revenue-earning power of the asset is relatively greater during the earlier years of its life, or where maintenance charges tend to increase during the later years, the declining-balance (or sum-of-the-years' digits) method may well provide the most satisfactory allocation of cost.**

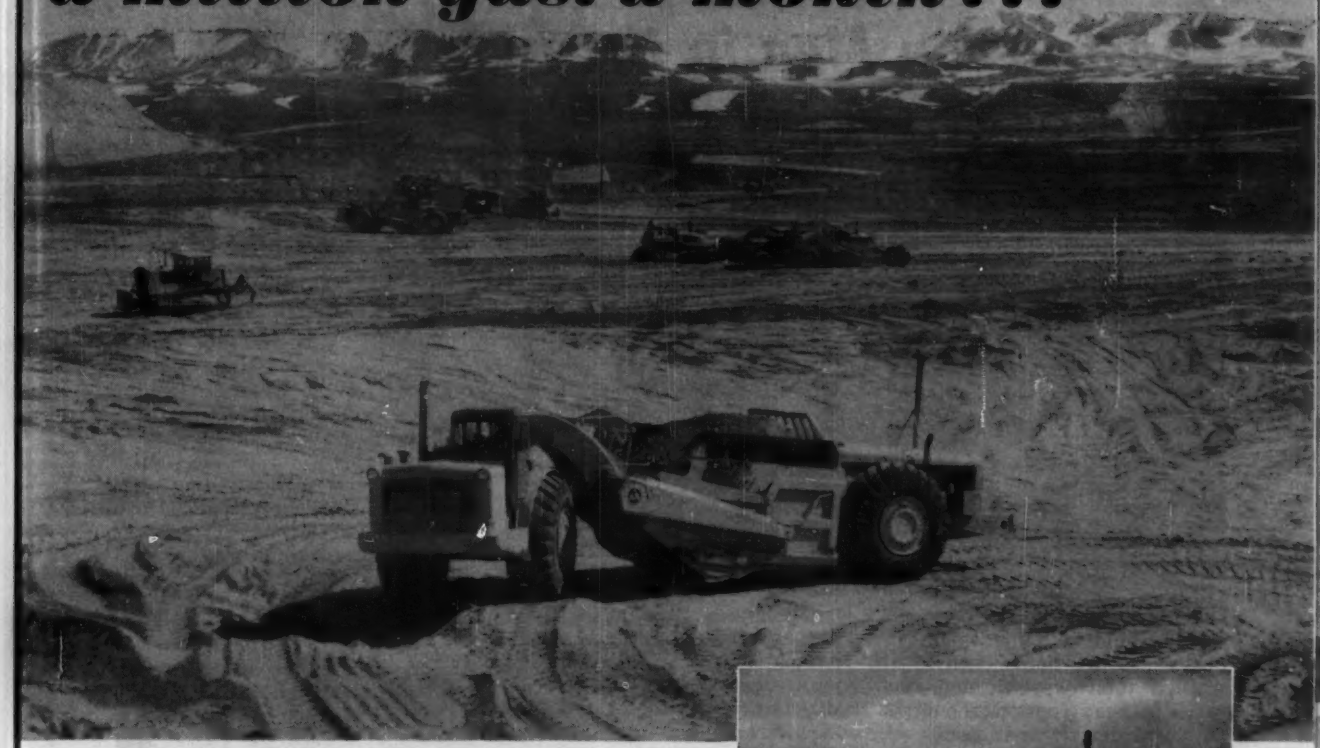
The revised bulletin recommends that when either of these accelerated methods is used for income tax purposes but not for financial accounting and the amounts are material, accounting recognition should be given to deferred (i.e., postponed) income taxes. The further suggestion is made that the tax deferred amounts should not be recognized as a liability but rather as additional amortization or depreciation applicable (and deductible) to such assets where it is reasonably presumed that the accumulative difference between financial and taxable income will continue for a long or indefinite period.

It may be desirable in some circumstances to supplement a contractor's financial statements with a footnote explaining the depreciation policies observed.

One can hardly refer to the general subjects of equipment costs and depreciation accounting without mentioning the accounting profession's point of view toward inflation and its impact on capital assets. Certainly the general effects of inflation on construction costs in recent years have made this subject a day-to-day problem in the business.

Observing that this matter is one of continuing importance, the Institute committee has formally considered the subject on three occasions in recent years—December, 1947, October, 1948, and June, 1953. The committee concluded on each of these occasions that no basic change in the accounting treatment of depreciation of plant and equipment was practicable or desirable under present conditions to meet the problem created by the decline in the purchasing power of the dollar. The committee did however support the use, where appropriate, of supplementary financial schedules, explanations or footnotes as a means of informing stockholders, employees and the general public of a business need to retain out of profits amounts sufficient to replace productive facilities at current prices.

a million yds. a month . . .



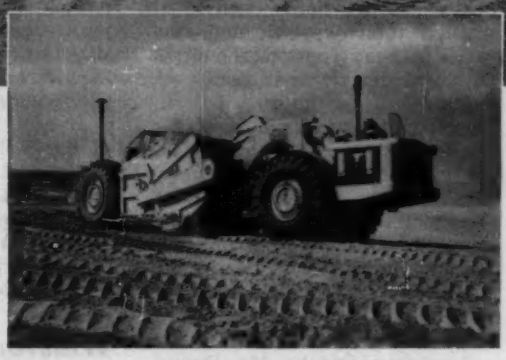
moved by Euclid "Twins"

At a mining operation in central Wyoming, a fleet of 18 Euclid scrapers is removing overburden from uranium ore at a rate of a million cu. yds. a month . . . nearly 21 million cu. yds. will be moved to uncover the ore body. It's a big, tough job to move that quantity of heavy sand over a mile of adverse grades up to 12%.

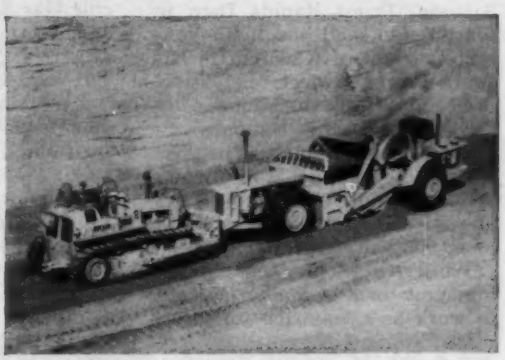
Maco Construction Co. of Rawlins, Wyoming, contractor on this stripping project, bought 12 Twin-Power "Euc" Scrapers of 24 yd. struck capacity to maintain high speed production. With two engines and all-wheel drive, these scrapers have the power and traction needed to move big loads up steep grades from pit to dumping area. Twin-Power is paying off in the big performance of Maco's five TC-12 Euclid crawler tractors, too—they're used for push loading this all-Euclid fleet of scrapers.

Wherever big tonnages must be moved on mine, quarry, industrial and heavy construction work, Euclid equipment provides more work-ability and better return on investment. The dealer in your area will be glad to supply facts and figures on Euclid rear-dump and bottom-dump haulers, scrapers, crawler tractors and front-end loaders.

EUCLID Division of General Motors, Cleveland 17, Ohio



Big power and big capacity pay off in big production . . . Euclid TC-12 Crawler Tractor has 2 engines that deliver 425 net h.p. . . . "Twin" Scraper of 24 yd. struck capacity also has 2 engines (563 total h.p.) and all-wheel drive with separate Torqmatic Drives for each axle.



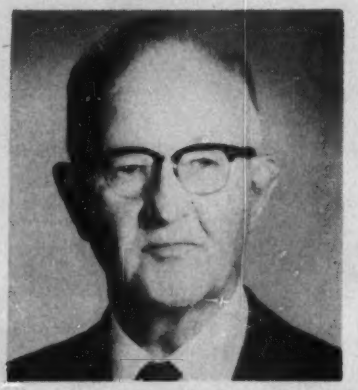
GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Construction Men in the News . . .

Moles Name 1960 Award Winners



WILLIAM DENNY (left) and GEORGE M. DRAKE are the recipients of the 1960 Moles Awards for outstanding achievement in heavy construction. Both men worked their way through the ranks to head construction firms with world-wide operations.

They will be the 20th pair to receive plaques given annually by the Moles since 1941 to one member and one non-member. Denny, the member, is executive vice president in charge of construction for Merritt-Chapman & Scott Corp. of New York. Drake is president and general manager of Johnson, Drake & Piper, Inc., Minneapolis, Minn.

A native of Sedalia, Mo., Denny began his career in the Midwest at the age of 18 as a fireman on a steam rig. He joined MC&S in 1927. He has been in his present position since 1953. Projects currently under his supervision include Glen Canyon Dam in Arizona, Priest Rapids Dam in Washington, and the main generating plant of New York's Niagara Power Project.

Headquartered in Minneapolis, Drake heads the company he helped form in 1941. The firm has an international staff of some 300 executives and during peak operations has employed as many as 40,000 workers.

While still in his teens, he left his home town of Madelia, Minn., to work as a teamster freighting dynamite and commissary supplies across the Dakota Badlands during the construction of the Milwaukee Rail Road main line.

Today, he is concerned with JD&P construction jobs all over the world. The firm is building a giant installation in Labrador for the Air Force. In Vietnam and Central America, it is constructing highways, buildings, bridge foundations, and dams. And it is joint venture sponsor for construction of 41 mi of the West Delaware Tunnel for New York City's water supply.

Mansell L. MacLean, president of the Moles, announced the selections at a dinner meeting in New York. Formal presentation of the plaques will be made at the Moles Awards Dinner at the Waldorf-Astoria Hotel, in New York on Jan. 27.

Winston

JAMES G. TRIPP, JR., is project manager for the third phase of the Kings River Tunnel Project near Fresno, Calif. A $13-million contract for the construction of the 3.5-mi tunnel, penstock, and powerhouse was awarded by Pacific Gas & Electric Co. to Winston Bros. Co., Minneapolis, Minn., and Greene Construction Co., San Mateo, Calif.

Ever since Tripp joined Winston in 1950, he has been involved in tunnel construction and the sinking of shafts. From 1950 to 1952, he was project engineer for the sinking and lining of two shafts, one 1,089 ft deep and 15 ft in dia and the other 927 ft deep and 20 ft in dia, for the Southwest Potash Corp. near Carlsbad, N.M.

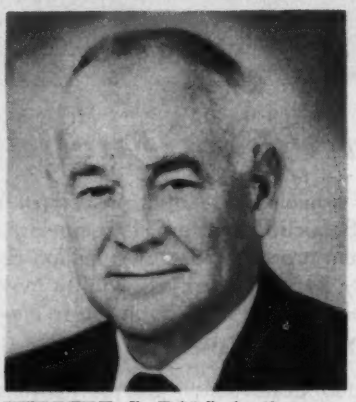
For the next three years he directed the sinking of a mine shaft by the freezing method for the Canadian Rock Salt Co., Ltd., near Ojibway, Ontario. This one was 1,082 ft deep and 16 ft in dia.

Next he was project engineer for two years on the Oahe outlet tunnels and shafts at Pierre, S.D. This project required driving and lining six tunnels, each about 3,200 ft long, and the sinking of six shafts from 175 to 205 ft deep and 33 ft in dia.

Before moving to Kings River, Tripp put in another two years at Ojibway to sink another shaft, also by freezing, for the Canadian Rock Salt Co.

At Kings River, he directs the driving of a horseshoe-shaped tunnel 14 ft in dia. Other personnel on the job are Norman Keene, project superintendent, and Gilbert Lindstadt, project engineer.

Twaits-Wittenberg



HERBERT C. BALL is the new general manager of Twaits-Wittenberg, Los Angeles, Calif., constructors and engineers.

Ball joined the firm in 1934 as a carpenter. Later, as construction superintendent, he directed diversified projects, including the $26-million cantonment for the U.S. Army at Camp White, Medford, Ore.

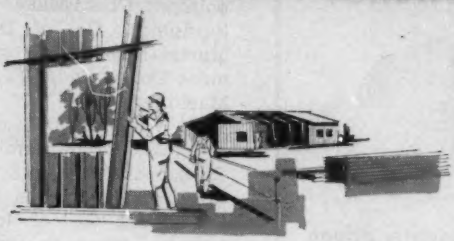
In 1956 he became general superintendent and in 1958 construction manager.

Garavaglia

FREDERICK W. NEU is now vice president and general manager of Louis Garavaglia Contractors, Inc., Warren, Mich.

Mr. Neu leaves the general contracting firm of Grove, Shepherd, Wilson, and Kruge, with principal offices in New York City, where he was employed for 20 years.

Artist's conception of completed Glen Canyon Dam and bridge.



It's hot, dusty and windy around this main office and administration building of Merritt-Chapman & Scott at the Glen Canyon Dam. But this Armco Building has all the modern conveniences and interior finish to make it comfortable and attractive.

HOW GLEN CANYON CONTRACTOR USES ARMCO STEEL BUILDINGS

Merritt-Chapman & Scott Corporation, New York, prime contractor for the Bureau of Reclamation's $108,000,000 Glen Canyon Dam in northern Arizona, has many Armco Steel Buildings at this construction site.

One interesting application is that of an L-shaped administration building, providing 9,000 square feet of office space. Because of frequent hot weather and dust-laden winds, the entire structure is air-conditioned.

Other Armco Buildings at this location include a power house structure, metals warehouse, tire storage and repair shop, and two twin-barracks for construction personnel—an additional 43,000 square feet of floor space.

At another big construction site—the Niagara Power Project in New York—Merritt-Chapman & Scott also has a number of Armco Buildings—some similar to those at Glen Canyon. These buildings, at both sites, were erected by Armco's Construction Department.

It will pay you to consider these buildings for *your* construction projects. Send coupon for free book on Armco Buildings. Armco Drainage & Metal Products, Inc., 7069 Curtis Street, Middletown, Ohio. In Canada: Guelph, Ontario.

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Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distribution, sales personnel and other activities.

Distributor Appointments

Bucyrus-Erie Co.: The W. W. Williams Co. of Columbus, Ohio, has been named as exclusive distributor of construction, mining, and quarrying equipment for the state of Ohio.

Minneapolis-Moline Co.: The following industrial construction equipment dealers have been appointed: Chesapeake Supply & Equipment Co. of Dover, Del.: Martin-Roasa Tractor & Equipment Co. of Cedar Rapids, Iowa; Machinery, Inc. of Charleston, West Va.; Capitol Road Machinery Co. of Columbus, Ohio; Chesapeake Supply & Equipment Corp. of Hyattsville, Md.; Deeds Equipment Co. of Indianapolis, Ind.; and Shade Equipment Co. of Winchester, Va.

Koehring Co.: Feenaughty Machinery Co. of Portland, Ore., has been appointed as distributor for the Parsons Co. division. Excavating & Paving Equipment Co. of Charleston, West Va., has been appointed distributor for most of West Virginia by the Koehring and C. S. Johnson divisions.

The Kwik-Mix Division has appointed The Excavating and Paving Equipment Co. of Charleston, West Va., as distributor for the State of West Virginia except the counties of Hancock, Brooks, Ohio, Marshall, Morgan, Berkeley, Jefferson, Hampshire and Hardy.

Western Machinery Co.: The Stevens Associates of Lakeland, Fla. and Johnson & Dealman Inc. of Newark, N. J., as distributors of its line of aggregate processing equipment.

Davey Compressor Co.: The following distributors have been appointed: Abele Tractor and Equipment Co. of Albany, N. Y.; Service Machinery Division of

5 PAVING RECORDS IN 14 MONTHS!*

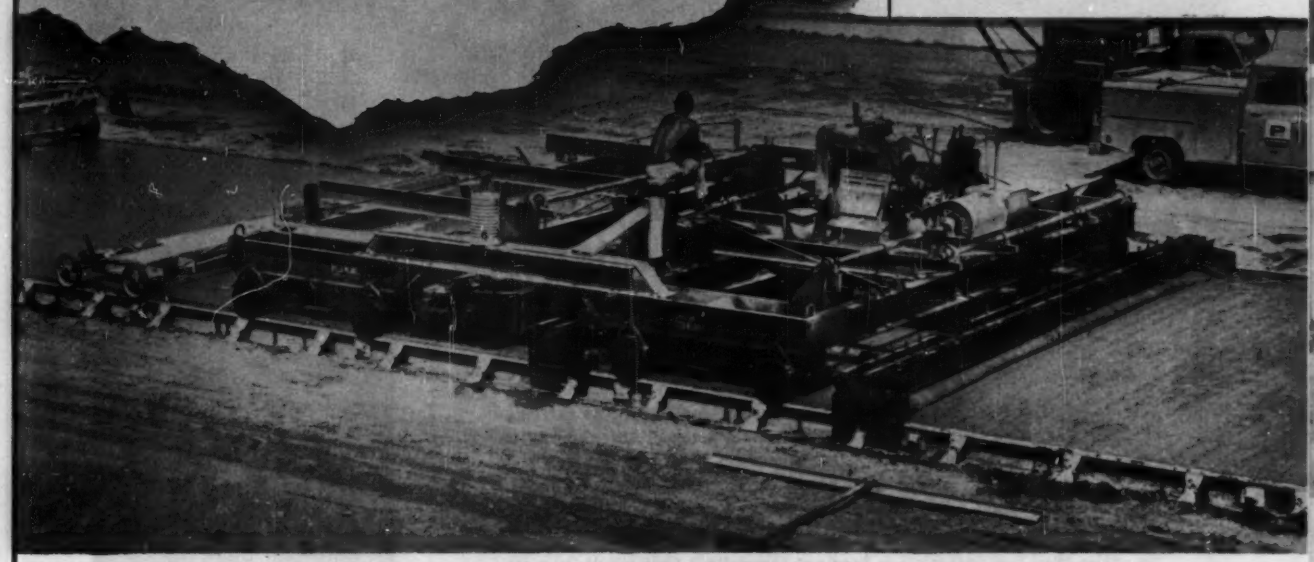
using Heltzel Flex-plane Combination Finisher-float Machines

** Paving records established using the Flex-Plane "Combination"*

1. **SARGENT CONSTRUCTION CO.,** Saginaw, Michigan, July,'58. 5787' of 9" x 24' slab in 12½ hours.
2. **DENTON CONSTRUCTION CO.,** Grosse Pointe Woods, Michigan, Aug. '58. 6029' of 9" x 24' slab in 12½ hours.
3. **KOSS CONSTRUCTION CO.,** Des Moines, Iowa, June '59. 6067' of 9" x 24' slab in 12½ hours.
4. **PIERSON CONSTRUCTION CO.,** Saginaw, Michigan, August, '59. 6244' of 9" x 24' slab in 12 hours.

Canadian Record:

5. **HURON CONSTRUCTION CO.,** Chatham, Ontario, July, '59. 5290' of 9" x 12' slab in 12 hours.



Michigan contractor finishes 6244 feet of 9"x 24' pavement in 12 hours...paves 5 miles in 5 consecutive working days!

The most recent of 5 paving records has been achieved by Pierson Contracting Company of Saginaw, Michigan. From Saturday, August 8th through Thursday, August 13th, they paved 26,526 feet of 9" x 24' pavement on U. S. 12 near Hartford, Michigan. Total hours worked—52.

On Tuesday, August 11th, 6244 feet were paved in 12 hours for the longest single day's run—and another new U. S. paving record.

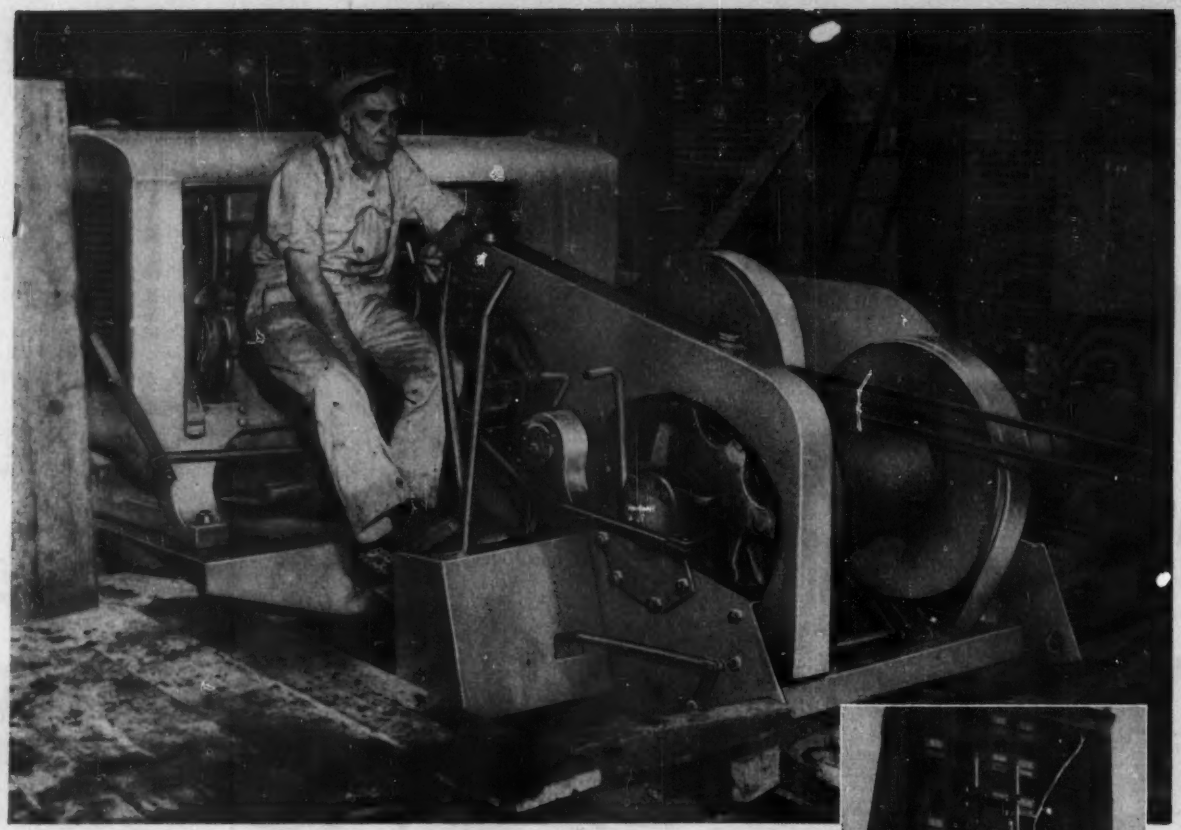
Speed is not the final measure of a finishing machine's worth. But the ability to produce a finish that meets or exceeds State and Federal specifications, plus the capacity to do it faster and more economically, is important to every paving contractor. Several of these record-setting contractors have stated that their record runs would not have been possible without their "Combinations". Further proof that top-rated contractors depend on Flex-Plane top-rated finishing equipment.

If you haven't seen the record-breaking 1959 Flex-Plane Gas-Electric Combination Finisher-Float Machine, call your Flex-Plane Distributor today or write direct to:

(above) Pierson's record-setting "Combination" at work on U. S. 12, Hartford, Michigan.

(below) Huron Construction's '59 Model Gas-Electric "Combination" setting new Canadian record.

THE FLEXIBLE ROAD JOINT MACHINE CO. Warren, Ohio



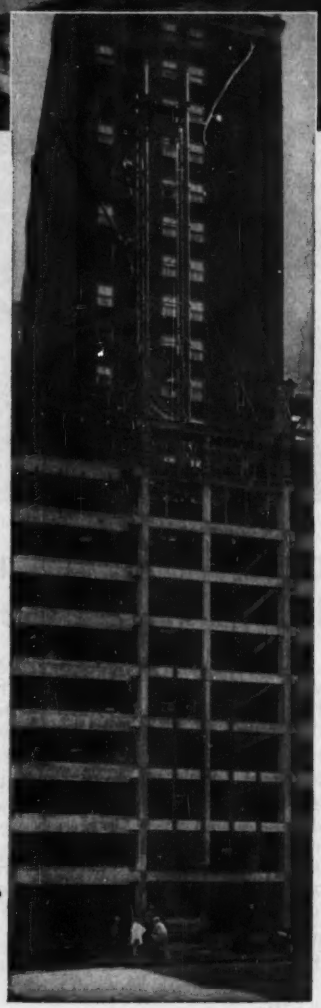
"The finest hoist I ever operated"

Ask the operator on any job why he likes his Clyde and he'll tell you feature by feature.

Maybe the internally expanding band friction clutch, its extremely easy and smooth engagement and release and the elimination of shock loads is a feature he appreciates most. Or the fact that he need only 'toe' the extra heavy duty, large diameter brake for safe, sure and accurate load control.

No doubt he will tell you about some of the many other features he likes . . . anti-friction bearings throughout that result in greater line pull with less power . . . low cost maintenance as well as low operating costs . . . correct diameter, semi-steel drums that afford smooth and rapid free spooling.

Clyde operators and owners too, are Clyde's best hoist salesmen . . . the finest compliment that can be paid to the modern engineering and precision manufacture of the Clyde line of finest quality material handling equipment.



For the complete story on the advantages of Clyde's design, write for Bulletin 34A.

This 15-story parking garage in St. Louis is but one of the many jobs on which this Clyde Hoist has helped to maintain or even better construction schedules.

CLYDE

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

CLYDE IRON WORKS, Inc.

Established 1898

DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : UNLOADERS
BUILDERS TOWERS : CAR PULLERS : ROLLERS

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d. **SELF-PROPELLED SCRAPERS**
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f. **STEEL ROLLERS**
g. **PNEUMATIC-TIRED ROLLERS**

10¢ each, 10 or more, 8¢ each

SALES AND SERVICE...
continued

Western Trailer Co. of Lubbock, Tex.; Central Machinery Co. of Abilene, Tex.; Anderson-Thomas Co. of Madison, Wis.; Way-Ken Contractors Supply Co. of Chicago; and Frontenac Equipment Co. of St. Louis, Mo.

On the Sales Front

Sika Chemical Co.; John F. Esping has been named head of Sika's new district office in Kansas City, Mo.

Nordberg Mfg. Co.: Harold N. Propp has ben named assistant western branch manager in San Francisco. Eugene T. Daum has been named sales engineer in the St. Louis office.

International Harvester Co.: Domestic construction equipment sales operations have been expanded from four to six regions. The following four regional sales managers have been reassigned: J. D. Gladden, Southwest region; P. D. Evans, Northwest region; H. E. Broadwell, Northeast region; and E. L. Boughton, Southeast region. R. A. Elliott and Jack Bess continue as regional sales managers of the Central and Western regions, respectively.

Electric Steel Foundry Co.: Henry Swigert is the new district sales representative in Arizona and New Mexico for ESCO. He will make his headquarters in Phoenix.

The Colorado Fuel and Iron Corp.; George C. Jennings has been named wire rope sales manager of the company. He will be replaced as New York District sales manager by Kingdon B. Dietz.

Jaeger Machine Co.: James D. Anderson has been named to the new position of vice president, sales, for the company. John H. Apel has been named vice president, engineering, to succeed Arnold S. Milliken, who has retired.

Massey - Harris - Ferguson, Inc.: John Vilven has been named general sales manager for Massey-Ferguson Industrial Division.

Yale & Towne Mfg. Co.: The Trojan Division has appointed the following district sales represent-

SALES AND SERVICE . . .
continued

atives: Tom Brockway, Dallas, Tex.; R. J. "Red" Lyons, South Orange, N. J.; and Robert C. Peterson, Littleton, Colo. Edwards G. "Ned" Stanhope has been named Yale hoisting equipment district manager for the New England area.

In the Main Office

Chain Belt Co.: Kenworthy J. Thompson has been named works manager of Chain Belt plants in Milwaukee county. He will be responsible for manufacturing and production in the chain and transmission division, heavy machinery division and foundries.

J. I. Case Co.: Dr. I. Richard Gregor has been appointed director of manufacturing for foreign operations.

Associations

Conveyor Equipment Manufacturers Association: Orlan A. Johnson, president of Gifford-Wood Co., has been elected president of the association to succeed J. B. Nordholt, Jr., president of Webster Manufacturing, Inc. Other officers elected at a recent annual meeting are: vice president, E. H. Woodberry, manager of Industrial Products Division of Lamson Corp.; treasurer, H. A. Barber, president of the Barber-Greene Co.; and secretary, G. H. Woodland, vice president of the Chain Belt Co. R. C. Sollenberger was re-elected executive vice president.

Special Mention

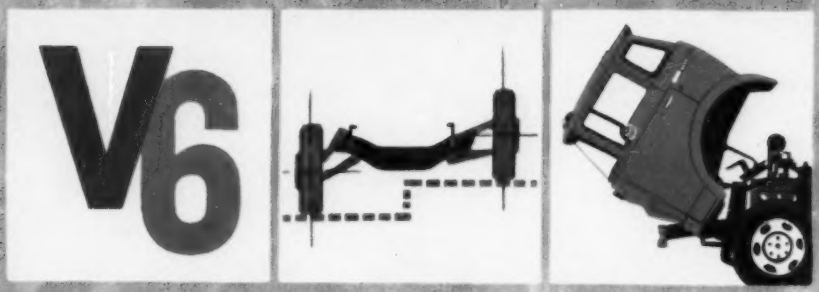
Iowa Mfg. Co.: In January, the company will hold its annual Maintenance and Operation Conference. Originated in 1946, the conference offers practical information on maintenance procedures, preventive maintenance and correct operating methods for aggregate producing, bituminous mixing and paving equipment. The conference will be divided into three sessions: January 11 to 25 will be devoted to aggregate producing equipment for contractors and producers; the period January 18 to 22 covers bituminous mixing and paving equipment for contractors and producers; and from January 25 to 29 a service school for Cedarapids dealers and service personnel will be held.

NOW

FROM OPERATION "HIGH GEAR"

THE BIG GMC BREAKTHROUGH

IN TRUCK ENGINE, CHASSIS AND CAB ENGINEERING



OPEN HERE

THAT DRASTICALLY CUTS YOUR TRUCKING COSTS


FROM OPERATION

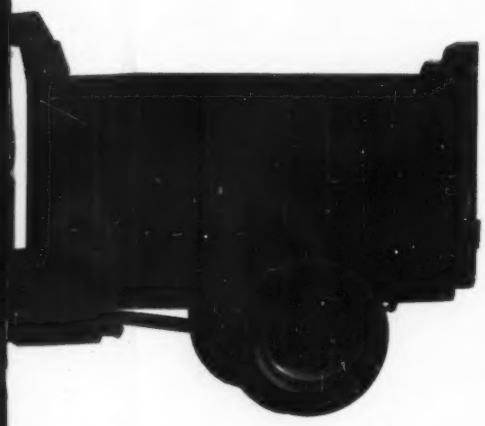
ON "HIGH GEAR" THE INDUSTRY'S GREATEST DESIGN, ENGINEERING AND QUALITY-CONTROL PROGRAM THE

This new B4000 Ninety-Incher is ideal for dump body, fla or other construction hauling. Available with 150, 165 o hp. V-6 engine. GVW to 23,000 lbs.

Biggest GMC Truck ever built—up to 120,000 lbs. GCW. BW9000 Series with 90" BBC offers contractors choice of Twin-Six gasoline or V-6 diesel power.

NEW CONVENTIONAL NINETY-INCHERS! This is the industry's first and only complete line of conventional-type Ninety-Inchers—19,500 lbs. GVW to the new giant-size 120,000 lbs. GCW. BBC is only 90". Front axle loading is ideal. Powered by four completely new V-6s, the revolutionary Twin-Six or modern V-6 diesels. Specially-reinforced double-life cabs. New easy-to-service four and six-wheel "Cost-Busters" for every construction haul.

THE MOST ADVANCED CONSTRUCTIO



r dump body, flat-bed with 150, 165 or 180

New, roomy Custom Suburban carries 8-man crew or hauls bulky loads. Four-wheel drive model makes its own road to any job site regardless of terrain or weather.

t. GCW. BW9000 Twin-Six gasoline

This is the rugged, new GMC Custom ½-ton pickup with Wide-Side body. Choice of 34 pickup combinations to meet construction use.

first and only
lbs. GVW to
t axle loading
nary Twin-Six
New easy-to-
tion haul.

NEW CONVENTIONALS! Announcing the new distinguished Conventional GMCs with bold, practical styling! Completely new, exclusive triple-life V-6 engines with lowest-cost, longest-lasting performance! Bigger, sturdier built cabs! Easiest-handling, smoothest-riding, hardest-working trucks ever built! From the handsome ½-ton pickup to the capable 45,000-lb. GCW tractor, new GMC Conventionals are superior in every way.

SE

CTION TRUCKS IN 20 YEARS!

New steel tilt-cab six-wheelers have ratings of 37,000–52,000 lbs. GVW . . . 50,000–76,000 lbs. GCW. Versatile LW5500 Series shown in full-tilt position with 7-yard mixer.

loads.
dless of

pickup with 8-foot
tions to meet every

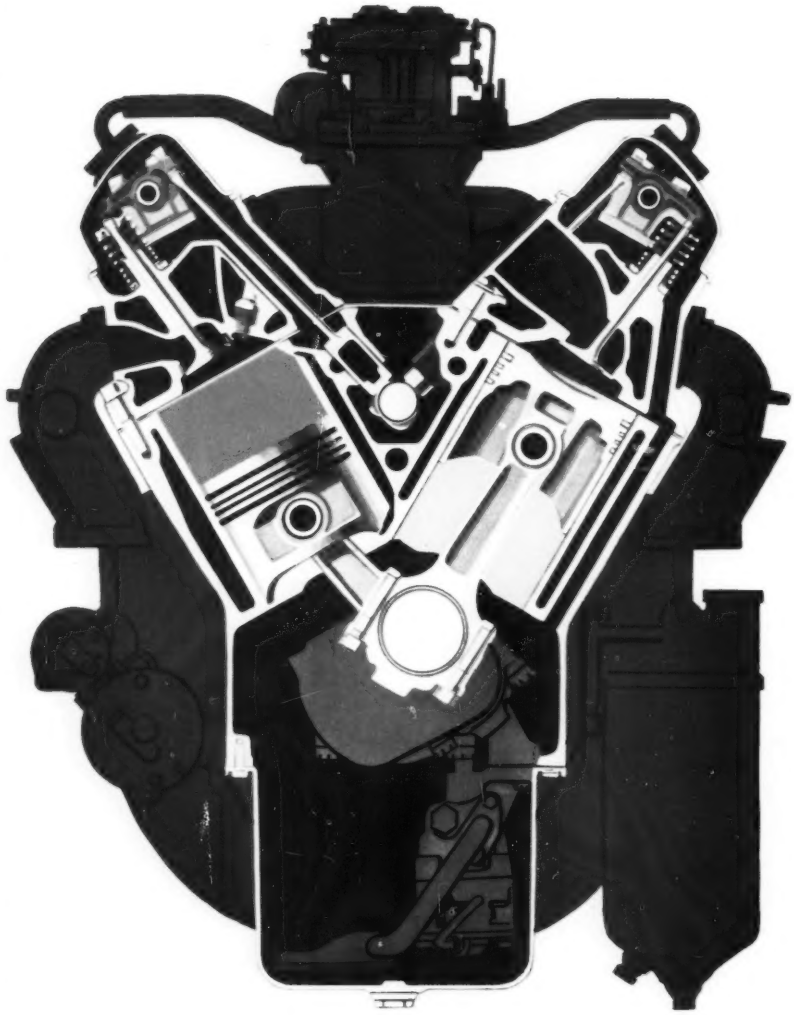
nventional
triple-life
r, sturdier
trucks ever
0-lb. GCW

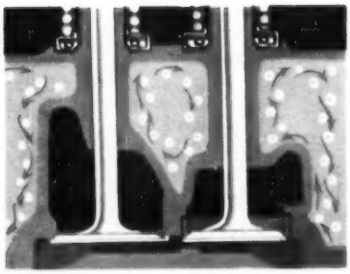
NEW TILT-CABS! For the first time—a complete new line of GMC tilt-cabs! 72-inch BBC with 52-inch front axle placement for bigger payloads, both volume and pounds! Powered by responsive, triple-life, high-torque V-6 and Twin-Six gas engines; and compact V-6 diesels! Full tilt completely exposes the engine for quick, easy servicing! Four and six-wheelers—19,500 lbs. GVW to 76,000 lbs. GCW.

PULL

SEE THE YELLOW PAGES FOR YOUR NEARBY GMC TRUCK DEALER

NEWEST, GREATEST ENGINE A

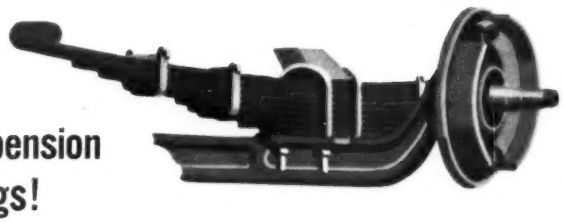




Coolest, Biggest Valves!

New GMC V-6 engines have three times better cooling (up to 176 gallons per minute) than all other comparable engines. Integral valve guides and the widest bridge between valves for the longest, most trouble-free operation. Less heat concentration, too, because no two exhaust valves are adjacent. Largest valves mean more work from every gallon of gasoline!

newest front suspension and springs!



Easier handling, smoother ride and less maintenance are all yours with GMC's new independent front suspension and torsion bar springs. One ride will convince you.

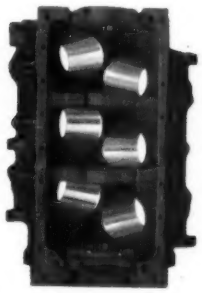
Larger models also have increased stability, shorter turning and improved handling . . . new, longer-lived, stronger I-beam front axles, wider spring centers and wider tread.

E ADVANCES IN 20 YEARS!

NEW V-6 most modern, most rugged engines built...outlast others up to 3 times longer!

Here is a completely new, more compact, stronger engine with the proved six-cylinder principle that produces full power over a broad range and at lower life-saving engine rpm. Actual tests have proved these new GMC V-6 truck-built engines last up to three times longer than other engines. Just a few of the reasons why are shown here. Ask your GMC Dealer for further factual, visual proof of the superiority of GMC's V-6 engines.

V-6 PERFORMANCE RATINGS		
Model	Max. Horsepower	Max. Torque
305A	150 @ 3600	260 @ 16-2000
305B	150 @ 3600	266 @ 12-1400
305C	165 @ 3800	270 @ 14-1600
351	180 @ 3400	312 @ 18-2000
401	205 @ 3200	377 @ 1400



Strongest, Most Rigid Block!

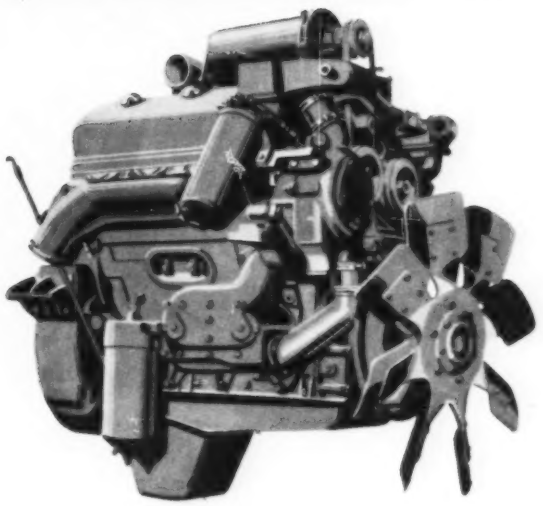
GMC V-6 engines have staggered cylinders, extra-strong inner ribbing—plus full 3-inch drop crankcase skirts to eliminate distortion and deflection . . . add years of life to all components.

NEW GMC TWIN-SIX exclusive design, greatest power!

This new GMC Twin-Six engine has the most pulling power of any standard gas engine! Highest torque over a broader, low rpm engine range reduces shifting as much as 60%. Ample reserve power permits you to maintain tight schedules with higher average speeds.

Notice maximum engine speed is only 2400 rpm! This means less engine strain, higher performance, lower costs and longer life.

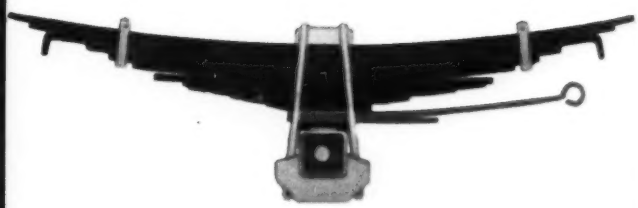
TWIN-SIX PERFORMANCE RATINGS		
Model	Max. Horsepower	Max. Torque
702	275 @ 2400	630 @ 16-1900



bigger brakes for surer stops!

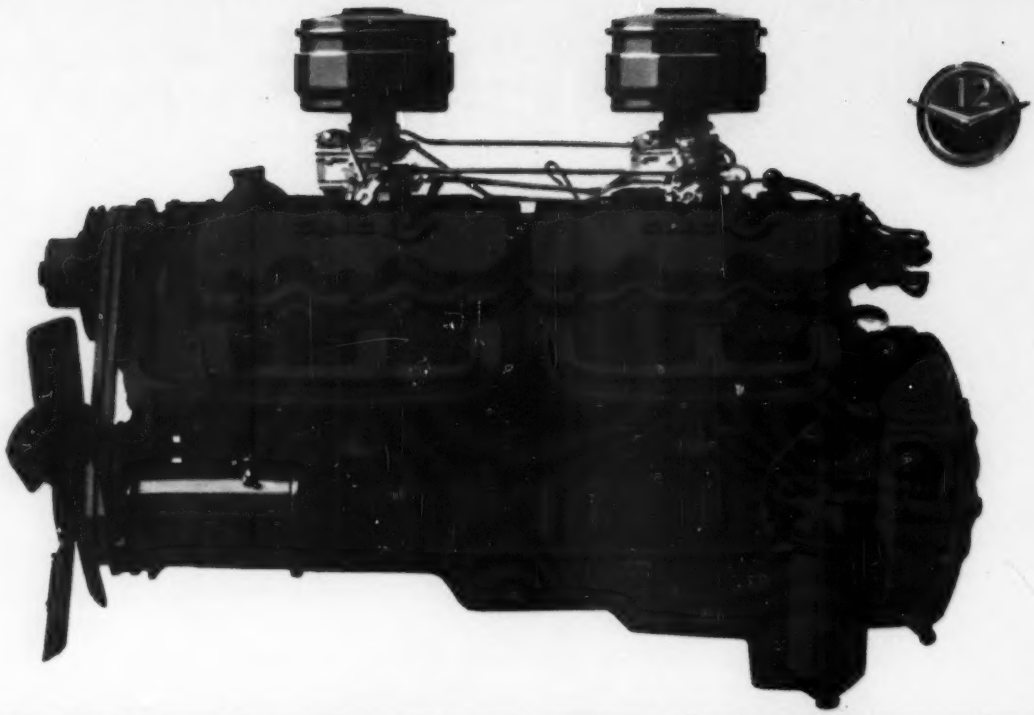
Longer life, too, with increased lining areas. New centrifuse drum with steel outer shell and cast iron braking surface has greater heat transfer.

Steel tilt-cab (shown) also has the biggest windshield, best safety-vision, of any truck.



new wider vari-rate rear springs!

Two-stage design and variable rate cam action provides a smoother ride, empty or loaded. Longer life, too, because radius rod leaf controls both torque and braking force. Springs only carry weight.



NEW GMC TRUCK V-6 DIESEL

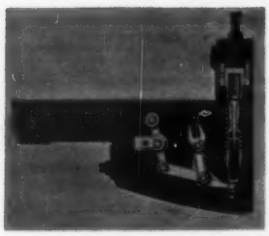
lightest, shortest and most efficient!

- **Up to 530 pounds lighter than comparable horsepower diesel engines!**
- **Only 42 inches long – shortest of any 6-cylinder diesel!**
- **Two-cycle design for best performance and greatest fuel-savings!**

With your GMC diesel engine and truck chassis, you get complete, convenient *one-stop* parts and service at your GMC Diesel Truck Dealer to save costly downtime and expense.

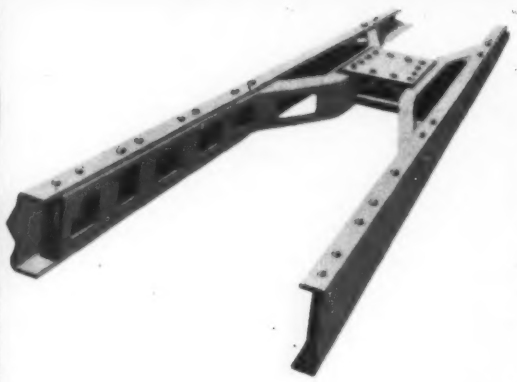
DIESEL PERFORMANCE RATINGS		
Model	Max. Horsepower	Max. Torque
6V-71	189 @ 1800 or 210 @ 2100*	577 @ 1200

*Optional at no extra cost.



Only GMC Trucks have this economy range governor that positively controls engine speed at most efficient point in top gears for outstanding fuel economy.

Save up to 5% on fuel and increase usable horsepower up to 7% automatically with GMC's exclusive hydraulic fan—standard equipment.



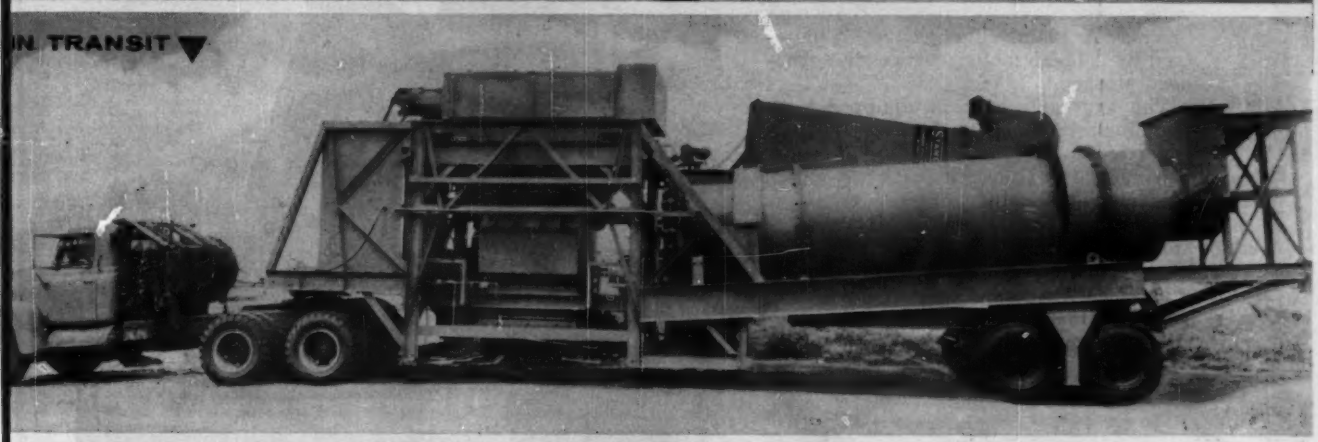
up to 35% stronger frames!

New design frames made of new materials are stronger and lighter to carry bigger loads of aggregate, dirt and cement dependably for years. 5500 Series and up have new, extra-strength SAE950 hi-tensile frames standard. New L-type reinforcements are also stronger.

GMC
GENERAL MOTORS CORPORATION
TRUCKS

From ½-ton to 60-ton
General Motors leads the way!

GMC TRUCK AND COACH—A GENERAL MOTORS DIVISION—PONTIAC, MICHIGAN



OMPLETELY PORTABLE 3000 POUND ASPHALT PLANT

The new STANDARD model TM 3000 pound portable Asphalt Plant is the largest batch type plant on a single trailer! **NO CRANE NEEDED!** STANDARD'S exclusive "push-button erection" automatically raises mixing unit into operating position in minutes.

CAPACITIES UP TO 120 TONS PER HOUR . . . Complete plant can be set up in one day. Those tough-to-figure jobs can now be money-makers . . . LET US SHOW YOU HOW!

STANDARD
ASPHALT PLANTS
"THE WORLD'S FINEST"

STANDARD STEEL CORPORATION

General Office & Plant: 5089 Boyle Avenue, Los Angeles 58, California
Eastern Division—Office & Plant: Lowell 89, Mass.
Midwest Division—Office & Plant: Decatur 89, Ill.

PARTS WAREHOUSES IN LOS ANGELES AND DECATUR, ILLINOIS

The rugged, massive Standard R-M Asphalt Plant packs more power, with extra capacity, over-sized vibrating screens, elevators, and dryers; larger bearings, heavier shafts and giant sized hi-speed pug-mill. This gives you the toughest and most economical asphalt plant in the world. Available in 2,000 to 8,000 pound batch capacities.

STANDARD Road-Master ASPHALT PLANT

ASPHALT PLANTS • ROTARY DRYERS • KILNS • COOLERS • CRYOGENICS

Construction Equipment News...

Tilt-Up Batch Plant Travels in Two Sections ▶

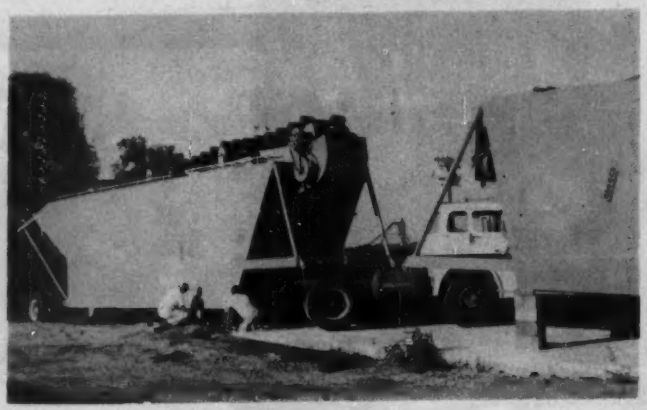
Transportation of the Con-E-Co Tilt-Up portable batch plant is simple. It breaks down into two separate semi-trailer units with weigh batcher, elevators, and enclosure doors in place.

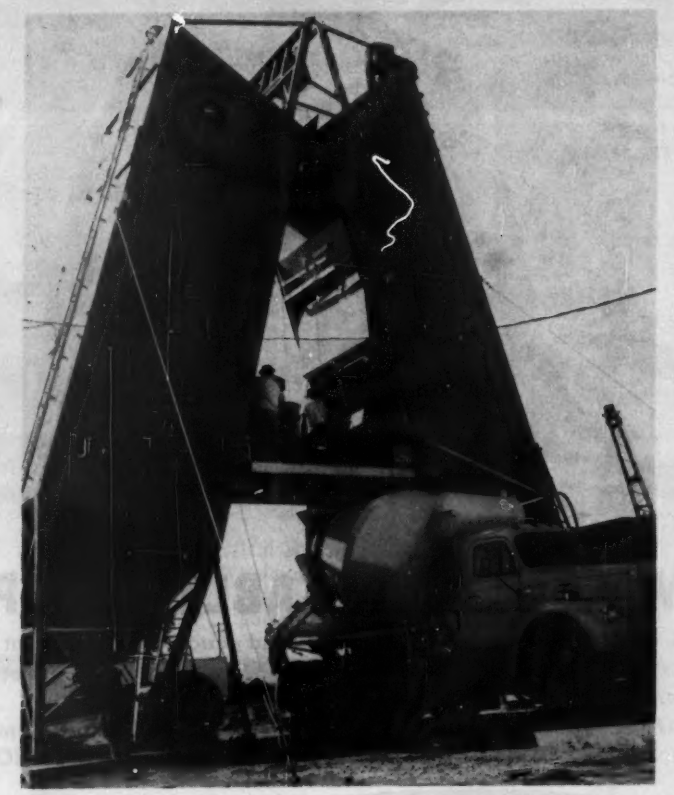
For operation the two units are pinned together at the front end and tilted up to a nearly vertical position. This becomes an overhead type plant with gravity feed from storage hoppers to weigh batchers and to truck mixers.

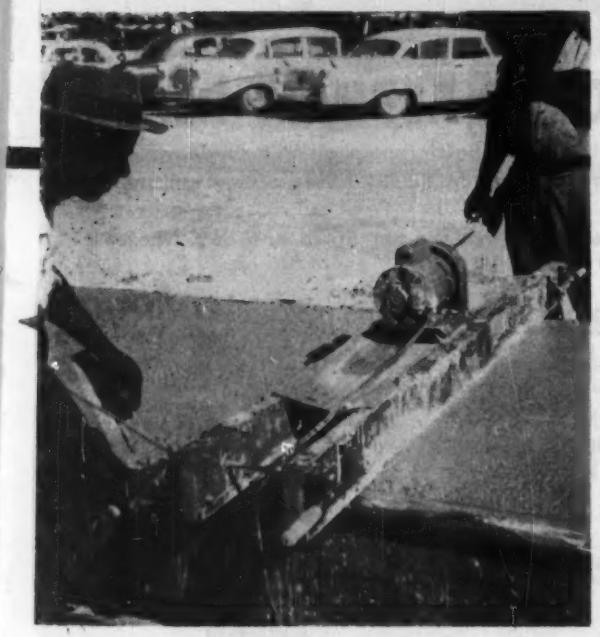
The cement unit storage capacity is 430 bbl. Of this amount 85 bbl are stored above the batcher and 345 bbl in a surge hopper below. Overhead storage capacity for the aggregate unit is 30 tons. Two surge hoppers in the lower section have a capacity of 20 tons each.

A 2-hp, two-speed, electric rotary vane feeder conveys cement to the weigh batcher. A 10-in. auger conveyor, powered by a 15-hp motor, charges the overhead storage.

The aggregate unit is equipped with two inclined bucket elevators with a capacity of 75 tph each. The elevators can move two different materials at the same time or both can move the same material to any one of four overhead storage hoppers. Aggregate bucket elevators are charged from a two-compartment feed hopper.—**Concrete Equipment Co., Inc., 1548 Front St., Blair, Neb.**







◀ Screed Adjusts Amplitude to Suit Job

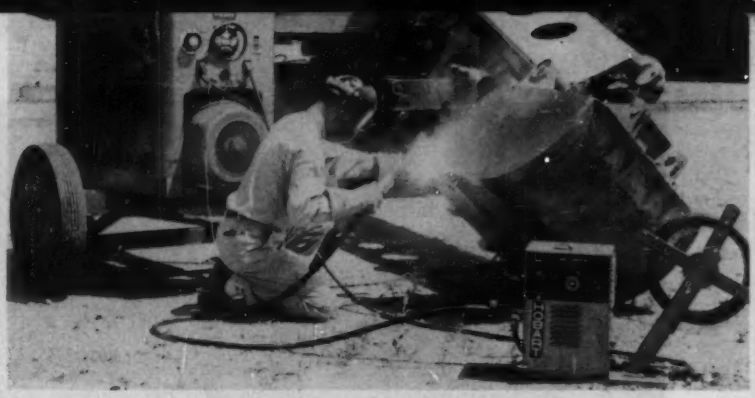
The Stow twin-beam screed is designed for striking off narrow slabs and prestresssed beams. Its amplitude of vibration can be adjusted to suit particular job requirements. To vary the amplitude, the rotating eccentric is turned on its axis and locked in position with set screws. The vibration propels the screed along while operators just guide it. The twin-beam screed actually makes two passes in one.

The screed is very light. A 4-ft long unit weighs only 140 lb. Either a 1-hp electric motor or a 2 1/3-hp gasoline engine supplies the power. Available lengths range from 4 to 12 ft.—**Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.**

Tubular Welding Wires Resurface Worn Parts

A line of tubular wires for resurfacing can be used with any semi-automatic welder. The fabricated wires contain alloys for application with either the open or submerged arc process.

The wires are 7/64 in. in diameter. They are furnished in 12-in. coils 3 in. wide. A coil weighs about 50 lb. —**Hobart Brothers Co., Troy, O.**



Ammonium Nitrate Carrier Mixes Explosives on the Job

The Baughman PE-6 ammonium nitrate transport is an explosive mixing plant on wheels. A built-in mixer measures the necessary amount of oil and adds it to the nitrate as it is unloaded.

A counter keeps track of the amount of explosive used per hole. The parabolic tank is divided into 4-ft compartments with a loading hatch for each.

A 9-in. screw conveyor feeds the nitrate into a rotary feeder that meters it into an air stream and into the discharge hoses. Controls and gages regulate the mixture when discharging.—**Baughman Mfg. Co., Jerseyville, Ill.**

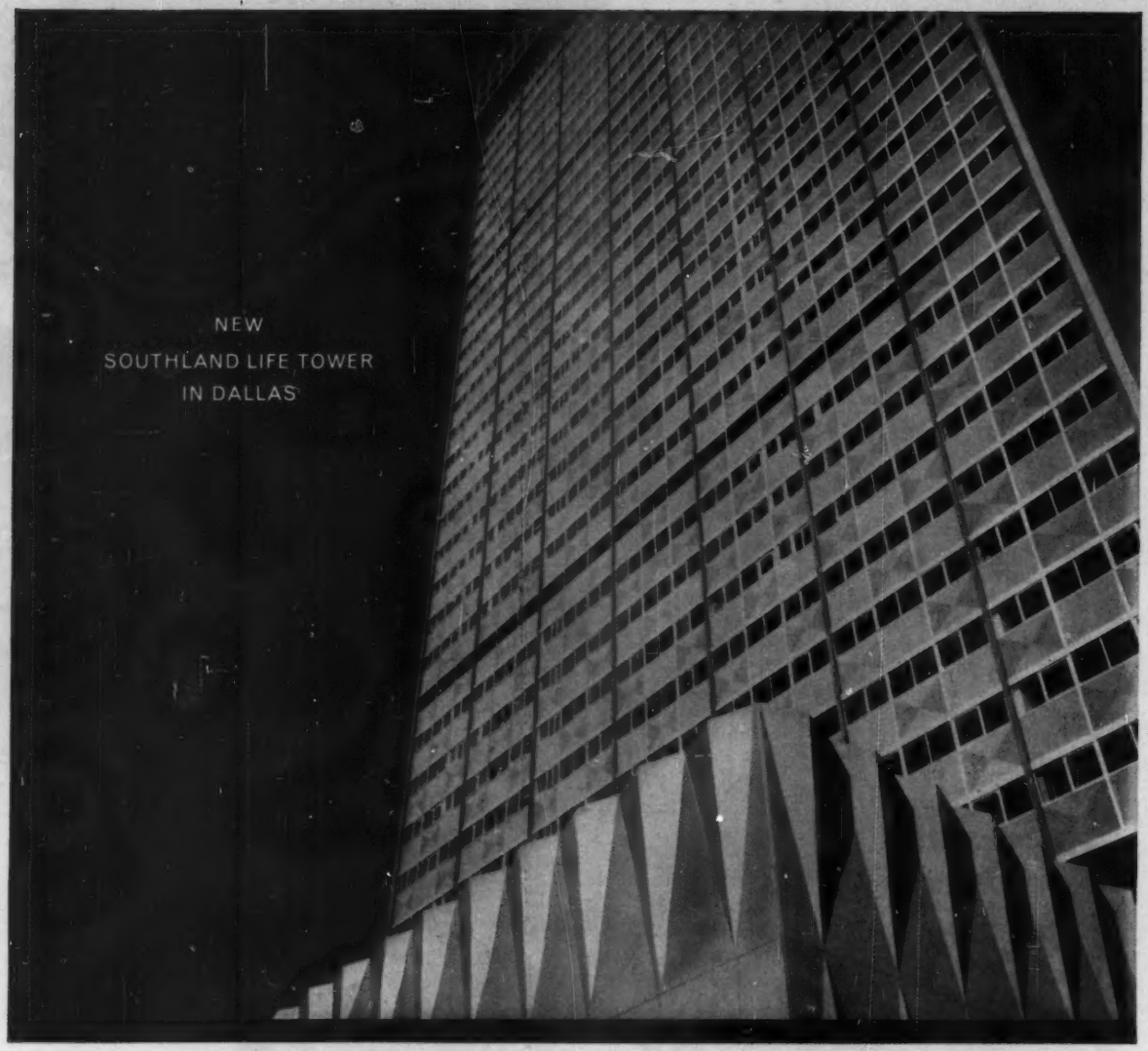
Truck Train Dumps Load to Either Side

A truck and one, two, or more trailers make up Differential's Wagon Train on Rubber. Both the truck and trailers can dump their loads to either side. A switch in the cab controls a solenoid valve on each body. The driver can dump the loads without leaving his cab.

For highway travel these trains are equipped with 15-ton capacity bodies, but for off-highway work they can carry 25 tons. The 8-ft wide bodies are identical for both the truck and trailers. Their capacity is 10 cu yd. The truck weighs 14,300 lb, and the trailers weigh 5,200 lb each.

A 256-hp V-8 gasoline engine powers the highway model. For off-highway work, diesels rated from 300 to 385 hp supply the power. Loads can be dumped in less than 30 sec without stopping the unit. The bodies tilt to a 55-deg dumping angle and can dump the load 3 ft from the tires. This is convenient when dumping over the edge of a fill. The doors fold down to keep the load from the wheels.

Turning radius is short. The trailers can swing to a 75-deg angle between them, and the train can turn around on a 38-ft road without backing up.—**Differential Co., Box 238, Findlay, O.**



Curtain walls of precast concrete achieve dramatic interplay of light, color and texture

The unbroken whiteness of the end wall is in striking contrast to bright, blue-green spandrel panels of the sidewalls. And on the broad base wall below, light and shadow form bold patterns across the sculptured facing. 42 stories, and the tallest office building in the West, the Southland Life Tower is part of a $35,000,000 project in downtown Dallas, Texas.

It's all done with concrete panels. For the end walls and base, exposed quartz aggregate and white portland cement give surface roughness and brilliance. The smooth-faced spandrels are ceramic tile cast in concrete. The total effect is one more example of the unlimited design possibilities in today's new forms of concrete.

Architects and Engineers: Welton Becket, FAIA, and Associates, Los Angeles and Dallas. Consulting Architect: Mark Lemmon, AIA, Dallas, Texas. Structural Engineers: Murray Erick Associates, Los Angeles.

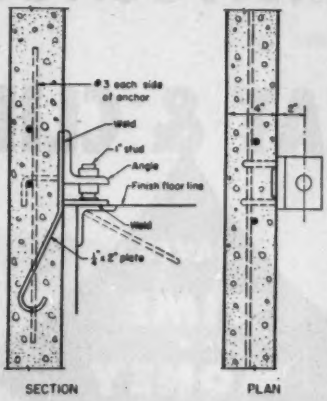
FOR STRUCTURES... MODERN **concrete**

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

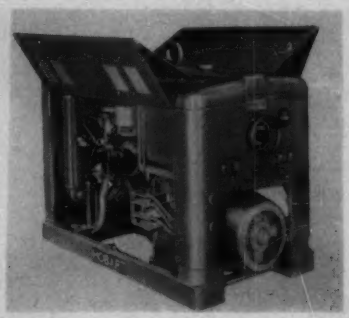
Curtain walls go up fast with easy-to-hang concrete panels

At the Southland Center (both the Southland Life Tower and the Sheraton-Dallas Hotel) panels were lifted from trucks, fastened to frame and the joints were sealed as construction progressed. Erection of concrete panels is fast and easy, saves money and construction time. Today, in similar construction everywhere, the use of lightweight concrete gives added ease of handling, over-all weight reduction. And because wall units often need no back-up, reduced cross-sections are achieved with concrete panels.



Fastening simplicity. The drawing above shows one method of connection. The use of studs gives room for adjustment, so panels can be accurately aligned in case of slight irregularities in the building frame.

Portland Cement Association



Combination Welder Doubles as Power Unit

A gasoline engine drives the Hobart combination arc welder and power unit. Only one engine and only one generator supply current for either ac or dc welding.

The unit is rated at 250 amp, 30 volts as a dc welder. For ac welding, the rating is 300 amp, 30 volts. As a single-phase, 110/220-volt ac power source it has a capacity of 10 kw. The available capacity while welding is as much as 3 kw. An auxiliary 110-volt dc power source of 1 kw is also available while welding.

Seven power outlets are located on the control panel in addition to the unit's welding and engine controls. Four of them are 100-volt ac receptacles, and two are three-wire twistlocks for 220 volts ac. The remaining outlet is a special 110-volt dc receptacle for a TIG welding package unit (CM&E July, p. 228).—**Hobart Brothers Co., Hobart Square, Troy, Ohio.**

In Production

Euclid has started production of its C-6 crawler tractor. The 211-hp machine weighs 42,000 lb. Top speed in forward and reverse is 7.9 mph. The cooling system is in the rear to improve visibility.

It has a Torqmatic drive consisting of a torque converter and a semi-automatic transmission that eliminates the master clutch. Changing speed ranges or shifting from forward to reverse is done under full engine power. A common braking and steering system controls the tracks.

The C-6 has an overall width of 100 in. and a length of 178 in. Track shoes are 22 in. wide with a total ground contact area of 5,069 sq in.—**Euclid Div., General Motors Corp., Cleveland 17, Ohio.**

Rear Dump Features Variable Wheelbase

The S-18 Euclid rear dump has a wheelbase of 20 ft in the hauling position, but only 13 ft 6 in. in the dumping position. The unit can turn around in 28 ft 8 in.

The S-18 consists of an overhung engine type Euclid tractor and a TS-2635 Easton trailer. Weight of the combination unit is 67,000 lb. Its rated payload is 70,000 lb. The trailer's capacity is 23 yd struck or 26 yd heaped.

A 336-hp GM engine powers the hauler. It is equipped with an Allison four-speed Torqmatic drive with converter lock-up. A Torqmatic brake is optional. Travel speed with full load is 25 mph. The tractor and trailer tires are interchangeable.—**Euclid Div., General Motors Corp., Cleveland 17, O.**

Two New IH Engines

Two six-cylinder, valve-in-head gasoline engines have been added to the International Harvester line.

The UB-264 develops 143 hp at 3,800 rpm. The smaller UB-220 has a rating of 112 hp at 3,800 rpm. Both weigh 810 lb. Standard design features include downdraft carburetion, counterbalanced crankshafts, gear-driven camshafts, and a 12-volt electrical system.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

Drillers get "more hole per hour with a REICHdrill" because . . .

ALL-HYDRAULIC TOP-DRIVE MEANS:

1. **Infinitely variable speed** of drill rotation from zero rpm to maximum rated speed of model — permits the right rotational speed for every formation.

2. **Safety torque release** which practically eliminates all chance of drill breakage . . . protects all drive components.

3. **Direct-drive to drill stem** eliminating power loss . . . no complicated transmission to wear or maintain . . . no rotary table.

4. **In and out of the hole faster** because no kelly is required.

5. **Operator can drill up as well as down** should bit become stuck.

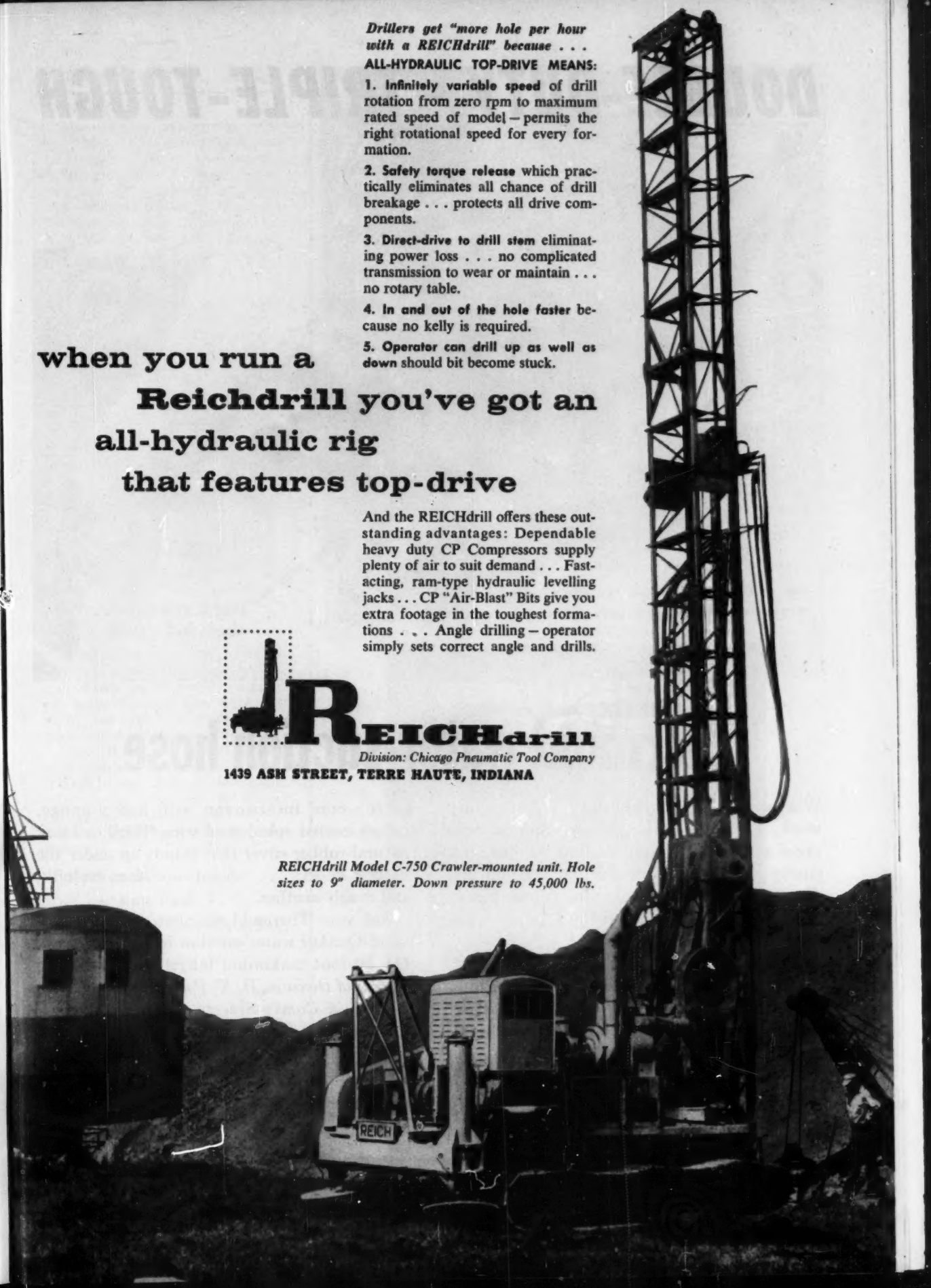
when you run a Reichdrill you've got an all-hydraulic rig that features top-drive

And the REICHdrill offers these outstanding advantages: Dependable heavy duty CP Compressors supply plenty of air to suit demand . . . Fast-acting, ram-type hydraulic levelling jacks . . . CP "Air-Blast" Bits give you extra footage in the toughest formations . . . Angle drilling — operator simply sets correct angle and drills.

REICHdrill

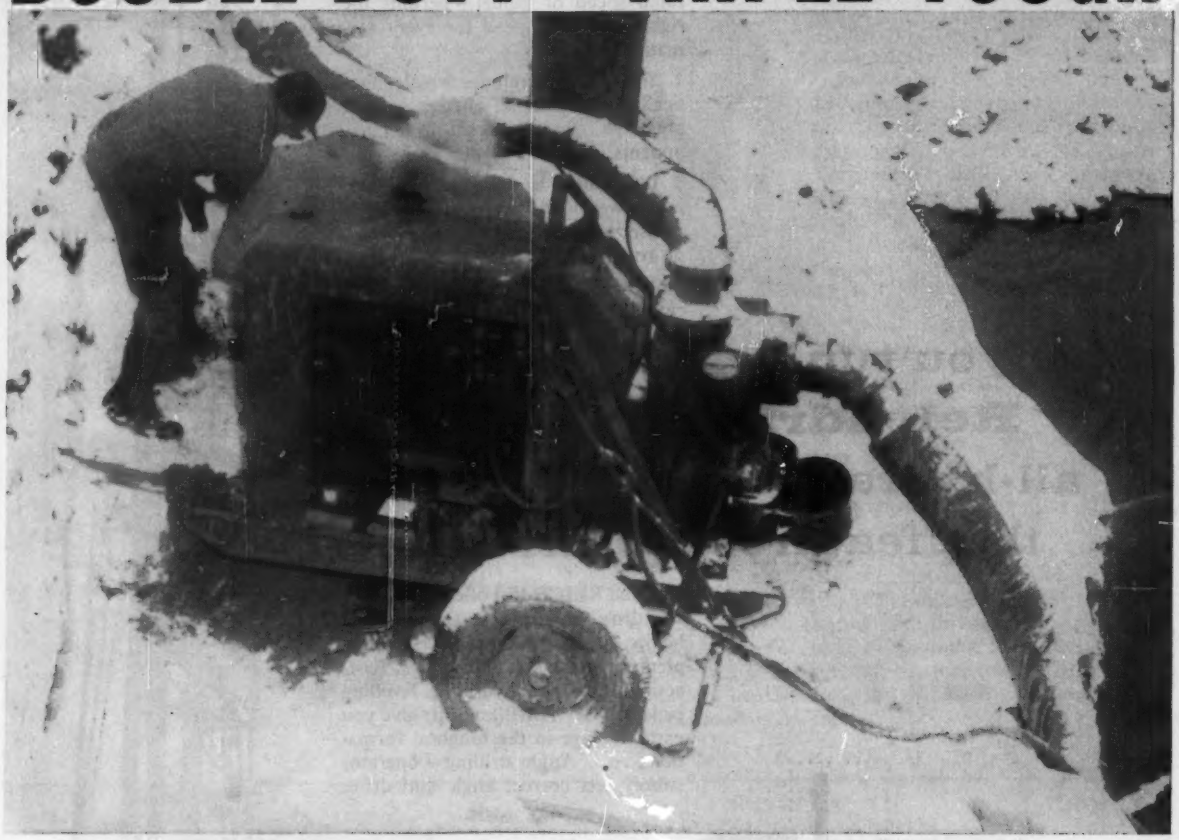
Division: Chicago Pneumatic Tool Company

1439 ASH STREET, TERRE HAUTE, INDIANA



REICHdrill Model C-750 Crawler-mounted unit. Hole sizes to 9" diameter. Down pressure to 45,000 lbs.

DOUBLE-DUTY • TRIPLE-TOUGH



Quaker Thermoid water-suction hose

Whether you feed it light-duty or heavy-duty work, Thermoid-Quaker water-suction hose gives you long, champion-like service. It's sturdy enough to withstand full vacuum and direct connection to centrifugal and piston pumps. Yet it's light and flexible . . . well-muscled but manageable.

The toughness comes in three layers. First, a black, natural-rubber tube that resists mild acids and alkaline water . . . abrasive sand and grit. Second, a strong, durable carcass of heavy cotton cord interwoven with heavy-gauge, copper-coated spiral steel wire. Third, a black natural-rubber cover that stands up under the hardest knocks . . . combats abrasion, sunlight, and rough weather.

Ask your Thermoid distributor about Thermoid-Quaker water-suction hose (1½" to 4" ID, 50-foot maximum lengths). Or write to *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Streets, Philadelphia 24, Pennsylvania.*

THERMOID DIVISION PORTER H. K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD

Maintenance is simple. The compressor's single cylinder can be inspected when the flip-top housing is opened. Rotor vanes, too, can be checked easily. For this purpose the oil pump, held on by six bolts, must be taken off and the bearing cap removed; this exposes the vanes.

The compressor is 8 ft 11 in. long. Dry weight is 1,605 lb. It can be skid-mounted or equipped with two rubber-tired wheels. One man can spot the compressor on the job.—**Le Roi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.**

Driver Switches Seats When Roller Reverses

The operator does not have to look back over his shoulder to roll in reverse. He merely switches seats because the roller is equipped with two of them for back and forth maneuvering.

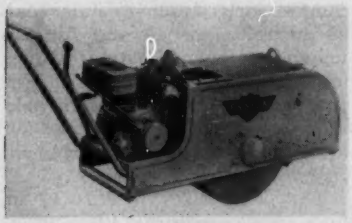
Gledhill's tandem steel roller is available in two sizes: 1 ton and 1½-2½ tons. Both models have only ½ in. overhang to allow rolling close to obstructions.—**Gledhill Machinery Co., Galion, Ohio.**

'Polydiesels' Run on Any Fuel

Three, four, six, and eight-cylinder models of the new Hercules diesels cover a horsepower range from 50 to 350 hp.

Four of the engines feature a combustion system that permits the use of all grades of diesel fuel, kerosene, lubricating oil, gasoline, or jet aircraft fuel. No adjustment is necessary when fuels are changed. These engines are the Hercules Polydiesels.

The new power plants are designed primarily for light and medium trucks (up to 55,000 lb gross combination weight.)—**Hercules Motors Corp., 101 11th St., S. E., Canton 2, Ohio.**



Vibrating Compactor Gets into Tight Places

The roll on this self-propelled vibrating compactor is only 13 in. wide, but it can exert a compaction effort equivalent to a 16-ton dead-weight roller. The Essick VR-13-W is handy for compacting in confined areas, around foundations, and in ditches.

A 4.8-hp air-cooled engine powers the compactor. It propels the rig at 1 mph in either forward or reverse. A separate clutch allows operation with or without the vibrating mechanism engaged.

The unit is 16½ in. wide, 73 in. long, and 37 in. high. It weighs 630 lb. For use on asphalt it can be equipped with a sprinkler tank, spray bars, and cocoa mat.—**Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.**

New Series Cat Tractor

The DW15 Series F Tractor incorporates improvements in the power train and the front suspension.

The front wheel spindles are cold-rolled to increase their service life by 50%. Floating sintered steel bearings on differential pinion gears give increased bearing support capacity. Also, the tooth beam strength of bevel gears has been boosted 30%.

The DW15 Series F is a 200-hp tractor. Improvements in the power train give the engine a 23% torque rise that cuts down gear shifting and improves acceleration.—**Caterpillar Tractor Co., Peoria, Ill.**

Rotary Air Compressor

Smallest rotary compressor just added to the Le Roi line is the 75RG1. It is a sliding vane-type, single-stage unit with a rating of 75 cfm at 100 psi.

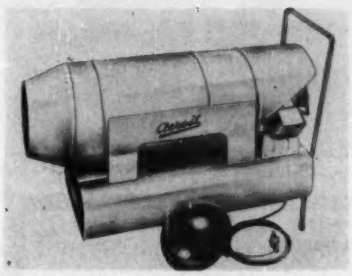
A four-cylinder Continental gasoline engine powers the compressor. Engine rpm is 1,850.

Crane Lifts 190,000 Lb

Largest crawler crane of the Koehring line is the new model 1295. It can lift as much as 190,000 lb at a 12-ft radius with a 60-ft boom. Maximum boom length is 170 ft of main boom or 160 ft of boom with a 30-ft jib.

The wide axles and 42-in. track shoes give the crane an outside to outside crawler width of 16 ft 10 in. The crawler length is 19 ft 3 in.

Optional equipment includes a third drum, automatic power boom lowering, power load lowering, and independent traction. These items can be added to the machine either at the factory or in the field.—**Koehring Div., Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.**



Space Heaters Burn Oil

Aeroil's line of space heaters consists of three models with capacities ranging from 125,000 to 500,000 Btu. All models burn either kerosene or No. 2 fuel oil. They are mounted on rubber-tired wheels.

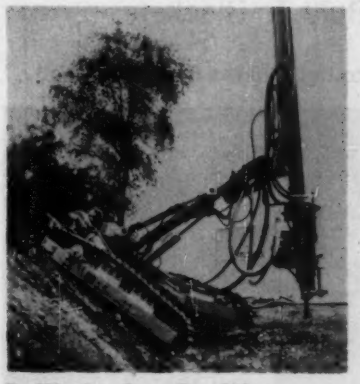
The units have stainless steel combustion chambers and gun type atomizing pressure burners. A 10,000-volt transformer supplies continuous ignition. Standard electrical connections are designed for 115-volt, 60-cycle current.—**Aeroil Products Co., Inc., 69 Wesley St., S. Hackensack, N.J.**

Hydraulic Doors Control Dumping Speed

An hydraulically actuated mechanism controls the two 3-ft bottom doors and one rear door on the Athey PW21 trailer. The system permits instant dumping of the load or slow dumping for spreading operations.

High-strength steel construction gives the trailer a weight of only 21,700 lb. It can carry 35 tons or 27 yd heaped. Struck capacity is 23 yd.

Prime mover is the Caterpillar DW21 tractor. Maximum travel speed for this combination is 27.9 mph. It can make non-stop turns in 40 ft.—**Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill.**



Drills in Any Position

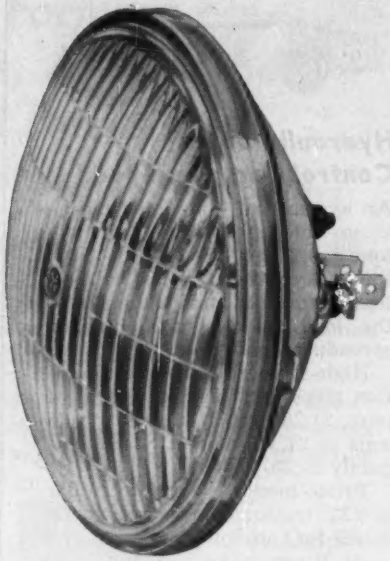
The Gardner-Denver Swing Boom Air-Trac can drill blast holes over the side of either track, in a horizontal position, or at any angle.

The boom swings in an 11-ft 10-in. arc. In addition, the unit is capable of breast-hole drilling as high as 9 ft 6 in. above ground level.

The ATD-3000 drill rig rides on tracks with 6 ft 3 in. of ground contact. Laminated rubber pads are standard and steel track shoes optional. Two independently controlled air motors power the tracks through chain drives. A single operator controls both the bracket and the boom. He has access to the controls from either rear or front of the rig.—**Gardner-Denver Co., Quincy, Ill.**

When your equipment is on the go 24 hours a day

...you need G-E C.I.M. lamps



*Flat, Far-Reaching Beam *All Glass Construction *6, 12 and 24-Volt Sizes
*Won't Shatter When Spattered *No Inner Bulb To Blacken

FLOODLAMPS to illuminate the work area...

G-E No.	Circuit Volts	Watts	Bulb Dia.
4078	6	50	5¾"
4478	12	60	5¾"
4578	24	60	5¾"

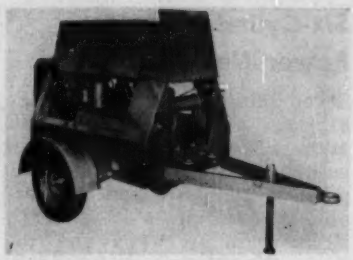
DRIVING LAMPS to light up the highway ahead...

G-E No.	Circuit Volts	Watts	Bulb Dia.
4080	6	50	5¾"
4480	12	60	5¾"
4880	24	60	5¾"

Choose and specify the General Electric C.I.M. Lamps (for Construction, Industrial and Mining Equipment) you need. See your G-E C.I.M. Lamp supplier today! General Electric Co., Miniature Lamp Dept. M-914, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

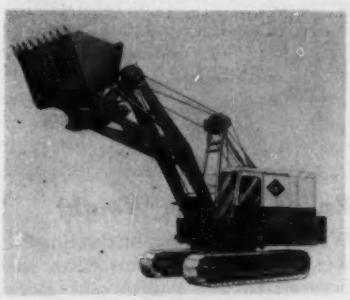


Single-Stage Rotary

The Gardner - Denver 85-cfm compressor is designed for jobs requiring limited air output but maximum portability. The self-contained two-wheel unit can be adapted for truck mounting.

The RP85 compressor is an oil-air-cooled, single-stage rotary unit powered by a four-cylinder engine.

The compressor vanes are accessible for removal, replacement, or inspection. Inspection plates permit access to vital parts for maintenance.—**Gardner-Denver Co., Quincy, Ill.**



Five-Yard Loader Swings Complete Circle

Bucket capacity of the new Lima loader is 5 cu yd. The machine also can be rigged as a shovel, crane, dragline, or backhoe. It has a horizontal bucket movement of 9 ft 10 in. and swings 360 deg.

Maximum dumping height is 16 ft 10 in. at 18-ft radius. The hydraulically operated bucket tilts 52 deg from the vertical for emptying.

Either gasoline or diesel engines are available for the unit. A torque converter is standard. The undercarriage can be mounted on either long or short crawlers.

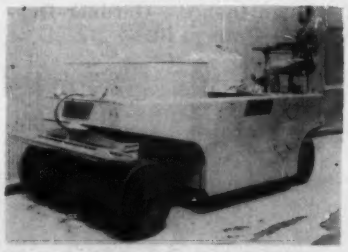
The loader can be converted in the field to a 1¼ or 1½-yd shovel, a 40 or 50-ton crane, as 1¼ or 1½-yd backhoe, or a dragline.—**Baldwin-Lima-Hamilton Corp., Construction Machinery Div., Box 427, Lima, Ohio.**

Six-Cylinder Engines Power New GMC Fleet

Seven different engines power the 61 basic models of 1960 GMC trucks. The engines include three gasoline and one diesel V-6, one gasoline Twin Six, and one gasoline and one diesel straight 6.

The gasoline V-6's and the Twin Six power most models. Their rated power ranges from 150 to 205 hp for the 6's and 275 hp for the Twin.

Transmissions include four, five, ten, and twelve-speed units and auxiliary transmissions. Hydra-matic transmissions are optional. Light-duty trucks have independent front suspension and rear coil springs. Air suspensions are available for heavier models. **—GMC Truck & Coach Div., General Motors Corp., 660 South Blvd., E., Pontiac 11, Mich.**



Roller Puts on Weight

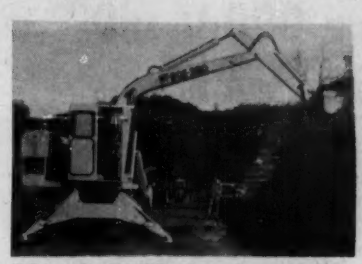
Water tank capacity of the Southwest VP-11 roller has been increased to 100 gal to add more weight and increase the compaction effort.

The self-propelled pneumatic roller covers a width of 84 in. Its rear wheels oscillate vertically. Coco mats, hydraulically controlled from the operator's seat, clean all wheels.

A single lever controls the roller in both forward and reverse. A lighting system is optional.— **Southwest Welding & Mfg. Div., Yuba Consolidated Industries, Inc., 351 California St., San Francisco 4, California.**

Pipelayer Gets Power Shift

The Caterpillar power shift transmission (CM&E Oct., p. 175) is now available on the Cat No. 583 Pipelayer. Horsepower rating of the pipelayer has been increased from 225 to 235.—**Caterpillar Tractor Co., Peoria, Ill.**



Digs 8 Ft Under Itself

The Hy-Hoe backhoe digs to a depth of 14 ft, has a reach of 23 ft, and can dig 8 ft under itself. The boom swings 360 deg.

The unit, built by Hydraulic Machinery Co., can be mounted on any truck chassis rated at 2½ tons or more. The 180-deg wrist-action bucket can dig straight walls and square corners.

The backhoe's unique boom design permits digging under walks, water mains, or structures, as well as under the backhoe itself. The 24-in. bucket has a capacity of ⅜ cu yd. Other buckets are also available—sizes range from 16 to 48 in.

Lifting capacity of the Hy-Hoe boom varies from 2,000 lb at a 20-ft radius to 7,500 lb at 10 ft. Outriggers work independently and can be adjusted to any level. Bucket teeth are interchangeable and easily replaced. All buckets are reversible for work as a backhoe or shovel.

The unit, excluding ballast, weighs 9,000 lb. Overall height for highway travel is 11 ft 3 in. and width is 93 in. A 69-hp motor with a 12-volt electrical system powers the unit. All controls are located in the cab.—**Hydraulic Machinery Co., 4685 W. Electric Ave., Milwaukee 46, Wis.**

Euclid Scraper Gets More Power

The two-engine Euclid TS-24 scraper now has a total horsepower rating of 563. This is an increase of 45 hp over previous models.

One GM diesel, rated at 336 hp, powers the tractor axle; the other, a 227-hp plant, drives the scraper wheels. Each engine has a separate drive that consists of a torque converter and semi-automatic transmission. The operator can use either or both drive axles depending on the job conditions.—**Euclid Div., General Motors Corp., Cleveland 17, Ohio.**

Construction Men Can Sleep Out In Coach That Fits Any Pick-up Truck

It takes only 15 min to install the Dreamer coach on the back of any pick-up truck. Its lightweight construction consists of white pine covered with an aircraft-type aluminum skin and painted to match the truck.

The coaches are adequately insulated for either summer or winter living. Interiors are birch finished. The galley includes a self-contained water system and an ice box. The dining area can be converted into sleeping quarters with accommodations for three.

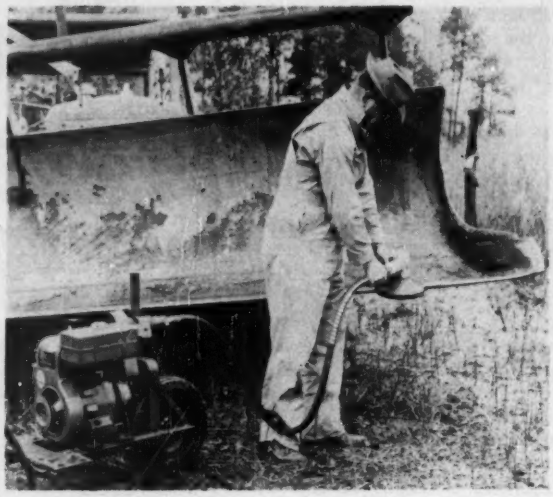
The lightweight Dreamer coach is available in three different basic models.—**Coons Custom Coach Manufacturing Co., Oswego, Kan.**

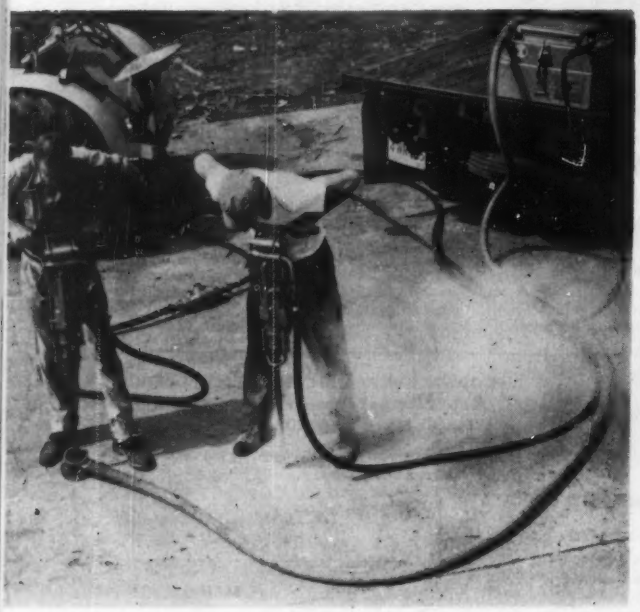
Self-Contained Grinders Sharpen Blades on the Job

Two lightweight portable grinders built by the Rome Plow Co. sharpen cutting edges of clearing blades anywhere on the job. One of these completely self-contained units can sharpen a blade cutting edge in 15 min.

The smaller of the two grinders weighs only 28 lb. A gasoline engine supplies the power. On the larger model a 7-hp engine transmits power to the grinding wheel through a 6-ft flexible shaft.

Both grinders utilize a 9-in.-dia reinforced Carborundum disk grinding wheel. The disk is ¼ in. thick and has a depressed center.—**Rome Plow Co., Cedartown, Ga.**





Rock Drill Operation Is Clean With New Dust Collecting System

Sinker drills can now work in residential or busy pedestrian areas without annoying the public with excessive dust. A dust collecting system developed by Le Roi fits any make of rock drill and keeps the operation clean.

The system consists of a collar that fits around the drill steel, a Le Roi DK280 dust collecting tank, and a hose connecting the two. The collar traps dust and cuttings, and the hose carries them to the collecting tank.

The dust collecting tank can be mounted on any truck that carries a compressor, or on a portable compressor, or on Le Roi's Tractair. A removable drawer in the tank can be pulled out for disposal of dust and cuttings. The drawer is 23 in. wide, 16 in. long, and 7 in. deep.—**Le Roi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.**

"Our 16000 and 21000 diesels have plenty of reserve power, with economy and dependability to boot,"

says S. T. Kimmes, partner, Kimmes-Bartelma Construction Co. of Hastings, Minn. "It's this kind of performance that proves I'm right in specifying Allis-Chalmers across the board."

An HD-16 tractor, powered by a 16000 diesel, pushes sand and gravel to the crushers—these crushers are also driven by 16000 and 21000 diesels.

A 16000 diesel powers this hopper at the pug mill.

21000 — 340 hp
(turbocharged)
16000 — 230 hp

Supplying and placing more than a million tons of subbase material for runways at a new midwestern Air Force base is typical of the jobs handled by the Kimmes-Bartelma Construction Co., Hastings, Minnesota.

Kimmes' aggregate plant shown above turned out 8,000 tons per day. These Allis-Chalmers 16000 and 21000 engines logged over 1,500 hours in three months. The only downtime on this job was due to wet weather.

Why is Kimmes' operation Allis-Chalmers-powered all the way? Because as he puts it: "These engines are in there giving us real performance day in and day out with no strain — in the tractors, on the crushers, and at the pug mill." They deliver the power and torque they are supposed to without overworking. The completely new Allis-Chalmers open-chamber combustion system makes the 16000 and 21000 the most economical, cleanest-running, fastest-starting diesels in their class.

Let your Allis-Chalmers dealer tell you more. Let him refer you to users — find out what they think of these "Performance-Proved" engines. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

***POWER* FOR A GROWING WORLD**

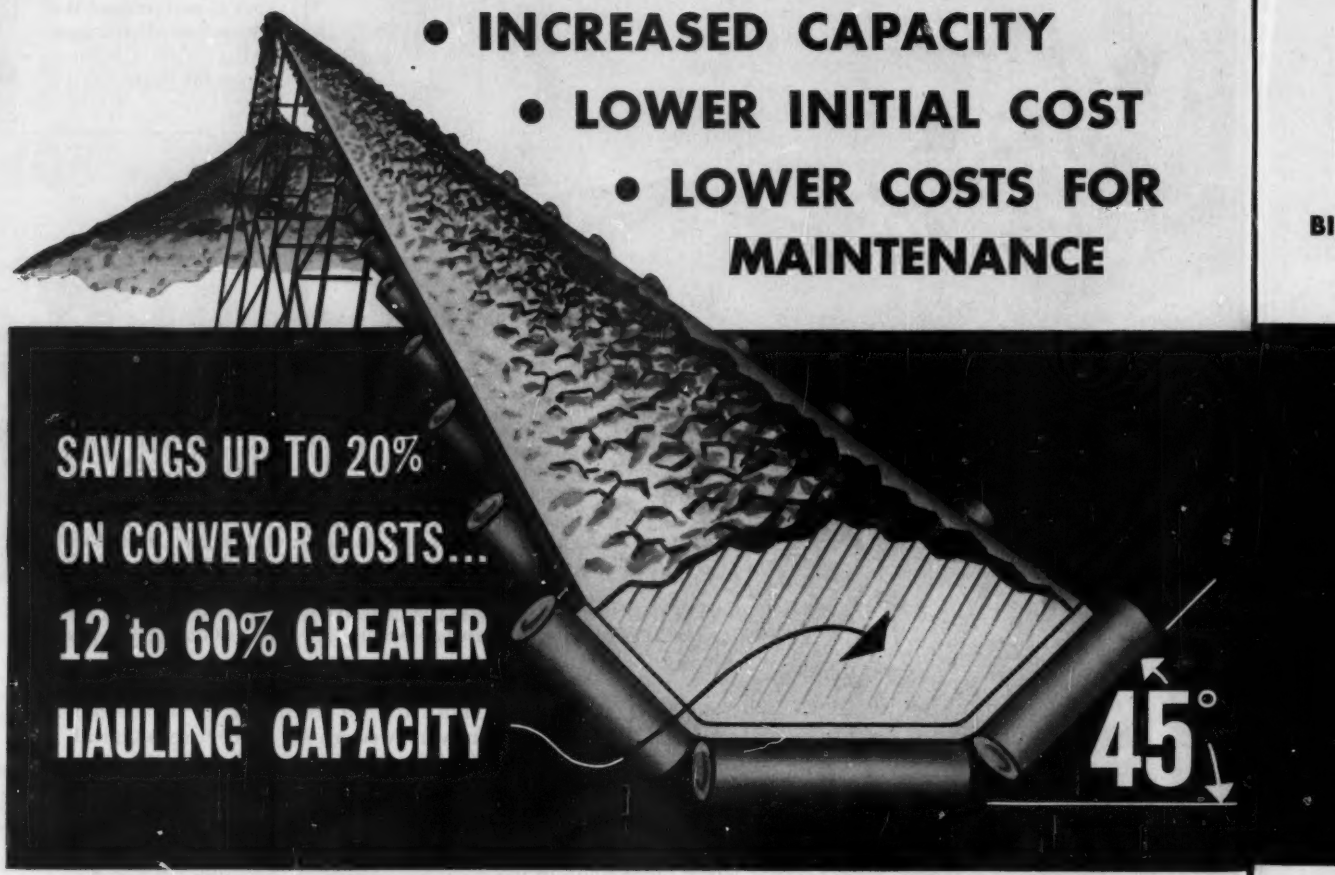
AC ALLIS-CHALMERS

8C-23

MOST IMPORTANT NEWS

NOW YOU CAN USE 45° IDLERS

- INCREASED CAPACITY
- LOWER INITIAL COST
- LOWER COSTS FOR MAINTENANCE



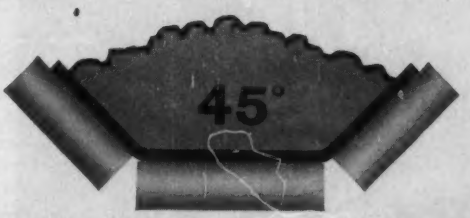
It's a mathematical certainty that a belt can haul bigger loads with 45° idlers than with regular 20° idlers. But the 45° angle between concentrating idlers and bottom roll idlers is too sharp for an ordinary heavy duty conveyor belt. Plies separate, but modern RAY-MAN CONVEYOR BELT licks this problem . . . for all time!

Ray-Man's exclusive flexible construction and built-in stress compensation is guaranteed to take the sharp angle of 45° idlers without ply or cover separation at the hinge line. This opens a whole new era of conveyor design . . . permitting larger loads . . . narrower conveyors . . . assuring longer cover wear . . . lower handling costs!

RAY-MAN GIVES YOU "*MORE USE PER DOLLAR*" WITH 45° IDLERS

IN CONVEYING TODAY!

...TO HANDLE ALL MATERIALS

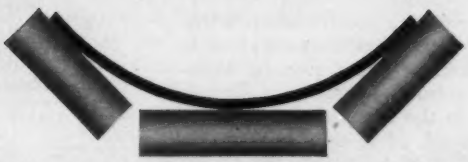


BIGGER LOADS, LESS SPILLAGE, LESS WEAR ON COVER WITH 45° IDLERS

20° IDLERS REQUIRE WIDER CONVEYOR TO HAUL SAME TONNAGE

Only RAY-MAN CONVEYOR BELT is BUILT to take the EXTRA STRESS OF 45° IDLERS

RAY-MAN IS GUARANTEED NOT TO PLY-SEPARATE AT 45° ANGLES



ORDINARY PLY BELTS ARE TOO BOARDY TO TAKE 45° ANGLES

Ask your R/M representative to show you how Ray-Man Conveyor Belt with 45° idlers can give you the most for your conveyor dollar . . . write for new Bulletin M303, "Ray-Man for 45° Idlers."

RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

RM

BM-961

ENGINEERED RUBBER PRODUCTS ... MORE USE PER DOLLAR

Maintenance Shop

Manual Hoist Becomes Electric Shop Crane

ADDITION of a storage battery, starter motor, solenoid switches, and a few other gadgets converts a manual hoist into an electric shop crane.

Such a conversion was made in the shop of McGuire & Hester, pipeline contractors of Oakland, Calif. Their fleet superintendent, Bill Holloway, supervised the conversion.

The original unit is a Yale Duplex manual spur gear chain hoist with a capacity of 1½ tons.

On the converted unit a standard 6-volt battery supplies the power. A fast charger restores the battery when the crane is not in operation. The battery has been replaced only once in 6 yr.

The crane's drive mechanism is a forward and reverse starter motor salvaged from the conveyor shift of a 410 Buckeye ditcher.

The chain hand gear was taken out of the original hand hoist and a sprocket was substituted. They used the biggest 35-chain sprocket that would go into the guard. An eight-tooth sprocket was installed on the motor.

BATTERY-POWERED SHOP CRANE—Starter motor and solenoid switches salvaged from old machines turn manual hoist into electric crane. Storage battery supplies power.

Solenoid switches from a Ford starter control the hoist. The two switches are located on a cable for remote control. They operate on a small wet cell battery.

The converted unit is husky enough to lift a heavy engine or the front end of a pickup truck.

Keep Fuel Clean to Avoid Engine Trouble

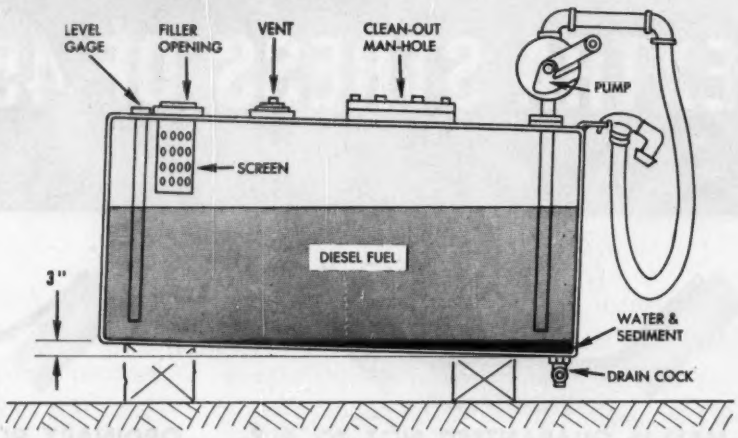
CLEAN FUEL is of vital importance for trouble-free functioning of all types of engines.

In diesel engines, for example, the clearance between the fuel injection pump plunger and the barrel is less than 0.0001 in.This means that dirt particles that are too small to be seen with the naked eye can cause serious engine trouble.

Preventing condensation is another important consideration in fuel handling and storage. Moisture condenses inside a storage tank in the space above the fuel. If enough of it collects, some of it will drip down into the fuel.

When fuel is stored in 55-gal barrels, make sure that the barrel is completely full. If there is no empty space inside the barrel, there will be no room for moisture to accumulate

A fuel tank on a machine is another place where condensation can occur. These tanks should be filled at the end of the day's work while the tank and the equipment are still warm. An empty space in the tank when the equipment begins to cool is a natural place for condensation.



GRAVITY CLEANS FUEL—Dirt and water settle to the low end of inclined field storage tank. Contaminants are drawn off periodically through a drain cock in the low end.

Here's how William Ammons of the Dexter Raines Construction Co. in Tennessee stores fuel to keep it clean.

He always tries to locate the fuel tanks on high ground or on hard surface roads. This permits bulk tank trucks to unload fuel without trouble.

Sufficient storage is another important factor. This permits the supplying company to deliver truck-capacity loads and cuts

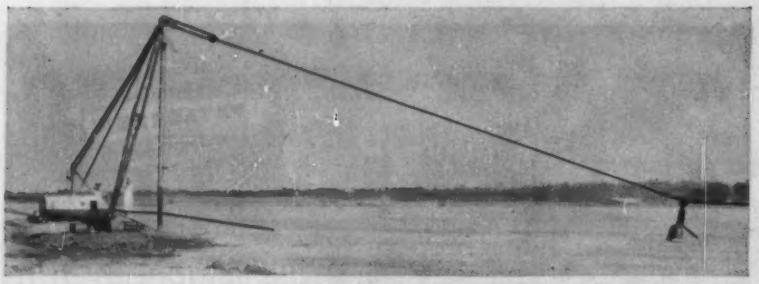
down on the handling. Reducing the number of steps involved in handling the fuel reduces the possibility of contaminating it.

Bill Ammons uses a field storage tank that permits separation by gravity. A storage tank is placed on blocks so that the drain end is 3 in. lower than the other end of the tank. Dirt and water in the fuel settle out to the low end of the tank. The stopcock is opened once a week to draw off the contaminants.

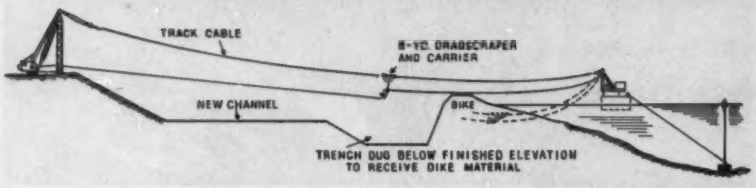
Ammons tries to permit at least 24 hr of settling before drawing off any fuel.

Wherever possible, he stores oil and grease drums in a horizontal position on wood skids. This prevents rain water and condensate from gathering around the bungs.

No matter what the system for storing fuel, keeping it clean is the most important consideration. It costs no more to take extra precautions when handling and storing fuel, but it pays off in trouble-free engine operation.



Eight-Yd. Sauerman DragScraper Cuts Seaway Dike Removal Costs



Atlas Construction Co. Ltd., Montreal, Que., had the job of enlarging the St. Lawrence Seaway channel near Iroquois, Ont. An 8-yd. Sauerman Crescent DragScraper and four-wheeled carrier was used with a crane to remove the perimeter dikes composed of tough digging glacial till and to backfill the trenches.

The hoisting line of the crane, used as a track cable for the Crescent and carrier, ran through a block on the boom tip to a 25-ft. tail tower mounted on a 20 x 40-ft. barge. The structural steel spud mast used to support the boom was pin-connected to facilitate movement of the crane.

After inhauling to the trench, the 8-yd. Crescent was gravity-returned part of the way to the excavation. A single-drum hoist mounted on the barge tail tower controlled the backhaul cable used to complete the return cycle. The job was handled by two operators, one on the crane and the other on the barge. The operating span varied from 600 to 900 ft. Average DragScraper hauls were 300 to 600 ft.

This is a typical example of how a crane can handle a Crescent DragScraper of greater capacity than the original dragline bucket or clamshell. Larger machines can usually double their capacity with a DragScraper. Smaller units can handle about 50% more. Machine range is limited only by the spooling capacity of the hoist drums. It can reach farther, dig deeper under water and take material out of soft areas without the nuisance of mats and the hazard of undermining the crane.

DragScraper traveling down track cable on return to underwater dike. Barge is in background.

When the boom is supported by a strut, a DragScraper of still greater capacity can be used. The strut increases overturning resistance and allows a greater load to be imposed. Crescents used in conjunction with such supports increase the rated capacity as much as 4 to 1.

Many operators consider the Crescent DragScraper as standard auxiliary equipment. The DragScraper permits bidding on and getting those premium jobs that could not be handled without considerably more time and expense by other means.

Find out how much you can increase your crane's capacity. Write or call giving the make, model number and boom length of your machine. Field Report 228 and Catalog J gives more information on DragScraper operations with cranes.

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

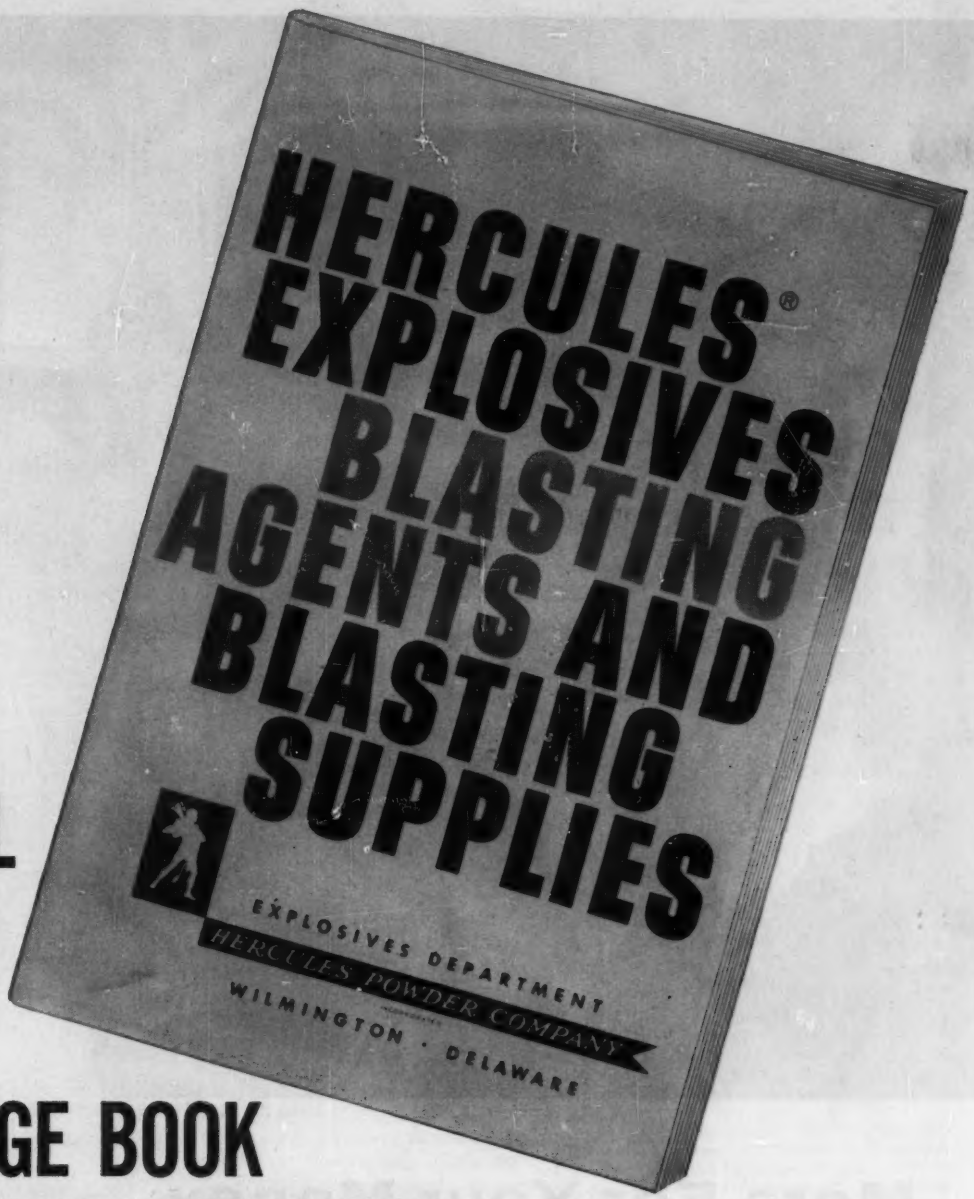
CRANE OUTRIGGERS — A 4-p bulletin describes hydraulically operated Power-Set outriggers for Lorain Moto-Cranes. It explains how the outriggers adjust to crowded quarters or uneven ground with the aid of curved outrigger beams individually controlled. — **The Thew Shovel Co., Lorain, O.**

CRUSHER—Mechanical features of the 36-in. Hydrocone crusher are given in an Allis-Chalmers bulletin. The crusher's hydraulic adjustment and three chamber sizes available for fine, intermediate, and coarse crushing are described. — **Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.**

LINER PLATES—Technical information on steel liner plates for tunnel and shaft construction is available from Commercial Shearing & Stamping Co. The 20-p bulletin contains tables of suggested thicknesses of plates for a variety of uses and a table of permissible safe loads on circular tunnels of various diameters of arch. It also includes installation procedures and tunneling methods. — **Commercial Shearing & Stamping Co., Youngstown, O.**

CONCRETE GRID SYSTEM—The Grid System of reinforced concrete construction is described in a 4-p folder. Included are illustrations of steel Grid domes, formwork and utility layouts, and safe load tables.—**Grid Flat Slab Corp., 761 Dudley St., Boston 25, Mass.**

LOADER CRANES — Straight boom and jib boom Power Loader cranes for mounting on trucks are described in a booklet issued by Daybrook. Complete specifications for straight boom models with 4,000-lb lifting capacity and a jib boom model with 7,000-lb lifting capacity are included.— **Daybrook Hydraulic Division, Young Spring & Wire Corp., Bowling Green, O.**



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You get more, you save more, with the new Homelite Model 8A Generators. You get more production power. Weighing only 140 pounds, complete with built-in gasoline engine, the 8A gives you 3000 watts. You get the power you need for electric saws, drills, floodlights and other labor-saving tools. You get the power you need for more work in fewer man-hours, quickly and easily.

Just as important, you get more performance with less maintenance and less operational trouble with the new Homelite Model 8A Generators. No rheostats or other controls to operate. Voltage is automatically controlled within four percent from no load to full load. There are no DC brushes. No commutator. No DC windings on armature. No trouble makers to slow down work and run up fix-it costs.

Three models are available . . . 115 volt and 115/230 volt, both 60 cycles, AC plus the 180 cycle model for running most efficient high cycle tools. Ask for free demonstration soon. The sooner the better for you.

Homelite factory branches are located throughout the country. Your nearest one is as near as your phone. Call them or write for convincing demonstration or rapid service in any way.

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NEW PUBLICATIONS . . .
continued

CONCRETE FORMS—A 12-p booklet explains Elgood inflatable rubber Voidcrete forms for casting voids in concrete. It illustrates the applications of the forms for prestressed or precast products, for cast in place concrete, and for drains, sewers, and pressure pipe.—**Elgood Concrete Forms Corp., 378 Ten Eyck St., Brooklyn 6, N. Y.**

CONCRETE VIBRATORS — A Wyco catalog shows concrete vibrators and attachments for concrete finishing, form cleaning, screening, and core drilling. It includes the electric motor and gasoline engine driven vibrators. —**Wyzenbeek & Staff, Inc., 223 N. California Ave., Chicago 12, Ill.**

EQUIPMENT CATALOG — A 64-p catalog covers the complete line of construction equipment manufactured by Chicago Pneumatic. It provides complete specification data on air compressors, rock drills, pneumatic and electric tools, and stationary engines. It also contains information to aid in the selection of compressors and recommendations for air pressure and air hoses in the use of pneumatic tools. — **Chicago Pneumatic Tool Co., 6 East 44 St., New York 17, N.Y.**

CALCIUM CHLORIDE — The Calcium Chloride Institute has issued a 40-p technical manual entitled Calcium Chloride in Concrete. It contains data on early and ultimate strength, cold weather protection, high early strength cement, and air entrained concrete. The manual contains a section on special conditions where calcium chloride can be used advantageously. Charts illustrate lab data from technical organizations. — **Calcium Chloride Institute, 909 Ring Bldg., Washington, D.C.**

SCAFFOLDS—The complete line of Baker portable steel scaffolds and accessories is illustrated in a 16-p brochure. Single scaffold units and the numerous set-ups with multiple units are included. —**Baker-Roos, Inc., 602 West McCarty St., Indianapolis 6, Ind.**

CRAWLER TRACTORS — Two International diesel crawler tractors are described in separate

NEW PUBLICATIONS . . . *continued*

16-p brochures. Features of the TD-6 are given in one brochure, including details of its 42.3-drawbar-hp engine. The other brochure illustrates the TD-9 with a 55.7-drawbar-hp engine. Booklets are available from the manufacturer and its distributors. — **International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

CONVEYOR SCREENS—A catalogue issued by Syntron details mechanical conveyor screens for scalping and coarse and medium sizing of materials. It contains complete descriptions, specifications, and data for three standard mechanical conveyor screen models.—**Syntron Co., 500 Lexington Ave., Homer City, Pa.**

HIGH STRENGTH BOLTING—A chart showing the proper procedure for installing high strength structural steel bolts has been issued by Republic Steel. It covers the installation method in four steps and identifies the parts of high-strength bolts and nuts. The chart can be tacked to the wall of the construction shack.—**Republic Steel Corp., Cleveland 1, Ohio.**

TRACTOR MAINTENANCE—A series of four-color cartoon posters prepared by J. I. Case Co. points out the importance of proper maintenance to tractor operators. The cartoons are presented in a humorous manner and geared to seasonal problems.—**J. I. Case Co., Inc., 1037 N. Astor St., Milwaukee 1, Wis.**

CRAWLER PARTS—A 4-p brochure illustrates the Tisco line of bulldozer sprocket rims, tractor pads, end bits, and blades. It illustrates the advantages of renewable manganese steel parts and describes the procedure for installing Tisco sprocket rims.—**Taylor-Wharton Co., High Bridge N. J.**

DUMP TRAILER — A bulletin describes the Easton rear dump trailer with a variable wheel base, powered by a Euclid Model 30 single-axle tractor. The unit, the S-18 rear dump, has a rated capacity of 35 tons, 26 cu yd heaped, and 23 cu yd struck.—**Easton Car and Construction Co., Easton, Pa.**

Supervising Authority: Federal Aviation Agency; Contractor: C. J. Langenfelder & Son, Inc.

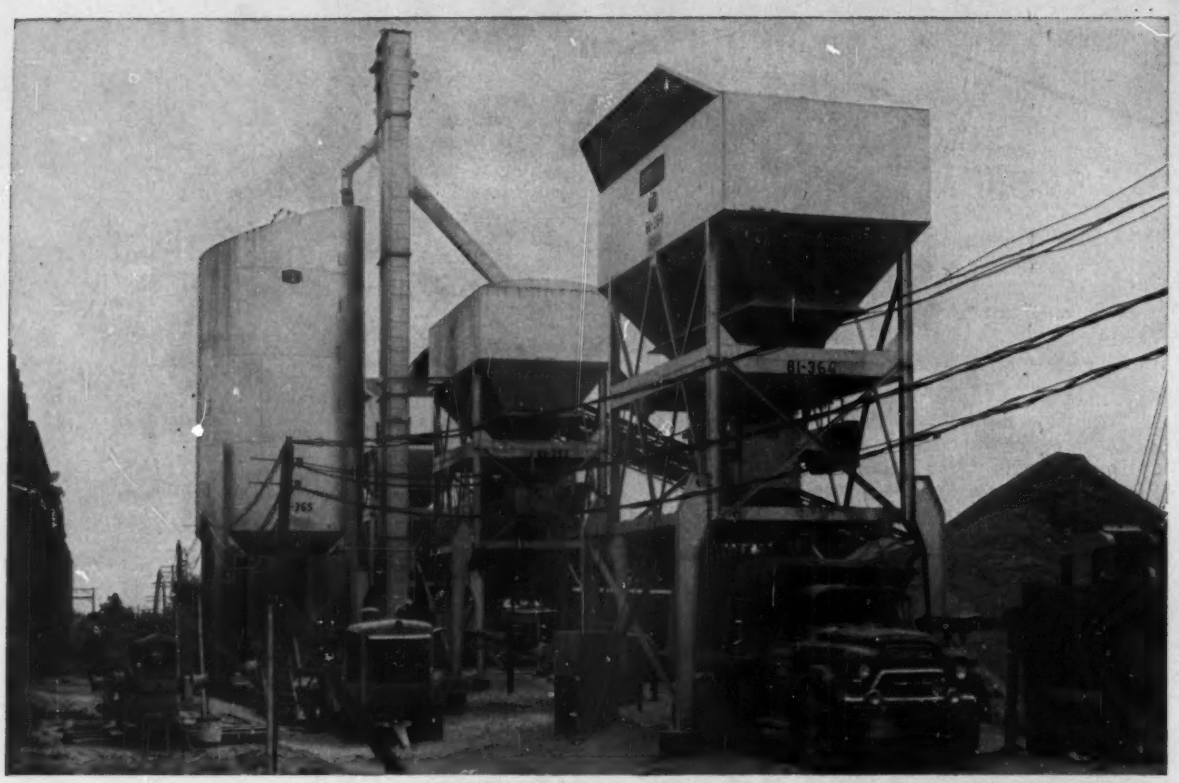
Bethlehem Wire Rope at Washington's New Dulles International Airport. On a 9,400-acre site at Chantilly, Va., about 23 miles west of Washington, D. C., some 11 million cu yd of earth and rock are being moved to make way for Washington's new airport. Upon completion in 1961, two 11,500-ft north-south runways, and one 10,000-ft east-west runway, each 150 ft wide, will be able to handle jet traffic with ease.

Bethlehem wire rope gets a real workout on much of the busy earth-moving equipment at Dulles. Here it is turning in the same reliable performance for which it is so well known wherever construction is in progress.

Bethlehem Steel Company, Bethlehem, Pa. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem wire rope

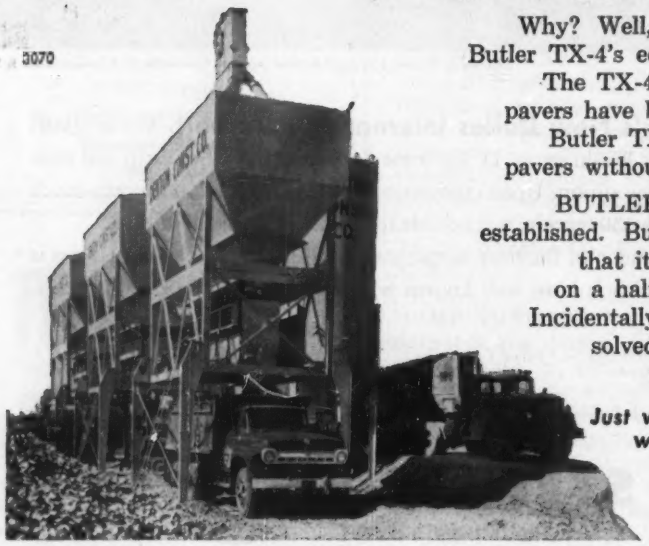
BETHLEHEM STEEL



Want To Set a WORLD'S RECORD?

. . . No one has even approached the ultimate possibilities in automatic highway batching

Sure, world's records have been established this year — well over 6000 lineal feet of 9 inch pavement, 24 feet wide, in a single day (and of course, with Butler TX-4 Roadbuilders Plants). But even that is far short of championship production.



Why? Well, all established records have been made with Butler TX-4's equipped with only one cement elevator. The TX-4 is designed for two. And three dual drum pavers have been the maximum on these jobs. The Butler TX-4 with two elevators can easily pace four pavers without taking a deep breath.

BUTLER was glad to see the past world's record established. But we know — as do the contractors involved, that it's like comparing speed records hung up on a half-mile dirt track with the Indianapolis 500. Incidentally the new TX-4 is vastly improved. It has solved the obstinate problem of providing unbelievable speed with extreme accuracy.

Just write BUTLER for the details. Then you'll know why your next plant will be a TX-4 for sure.

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949 BLACKSTONE AVE. • WAUKESHA, WIS.

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Methods Memo . . .

We All Should Know

There's a lot of talk about "the soaring cost of the interstate highway building program." But few people realize that actual construction costs are lower now than they were three years ago when the 1956 Highway Act first went into effect.

The latest construction cost figures from the Bureau of Public Roads make this clear. Here's the proof from BPR's Price Index for Federal-Aid Highway Construction (in this index the 1925-29 average price equals 100).

	Third Quarter 1956	*Third Quarter 1959*
Excavation	*109.7*	*108.6*
Surfacing	*180.3*	*177.6*
Structures	*260.5*	*247.1*
Composite Mile	*167.2*	*163.4*

These figures are extremely important to contractors—and to anybody else who believes a first-rate system of interstate highways is essential.

Instead of talking in generalities about the "soaring costs" of highway construction, people should understand that the roadbuilder is taking less money for his work than he did three years ago. And this is in spite of the fact that materials, labor, and equipment all cost the roadbuilder more than they did three years ago.

Another Power Unit

The chances are that many construction machines will be powered by some new type of engine within a few years.

But what type? There are gas turbine engines and free piston engines and more recently fuel cell power units. Now a new contender is a rotating combustion engine with only two moving parts.

This newest entry was unveiled last month by Curtis-Wright Corp. They say engines in the 100 to 700-hp range will go into production next year, but they aren't willing yet to say much about what advantages these engines may have as power units in construction machines.

They do say the rotating combustion engine will be compact, lightweight, and more efficient than standard gasoline engines. It will require no valves, springs, camshafts, pistons, or connecting rods; the rotor inside the engine chamber and the crankshaft are the only moving parts.

An automotive carburetor delivers a mixture of gasoline and air into the engine chamber through a side wall port. As the rotor turns, the mixture is compressed and fired by a single sparkplug. The crankshaft transmits three power sequences per revolution.

No Man's Land Disputes

The National Labor Relations Board has set up new procedures to speed action on some labor disputes.

The new procedures enable an employer to file a petition with NLRB's Executive Secretary asking an advisory opinion as to whether the dispute comes under NLRB jurisdiction or should go before a state court. This is aimed at eliminating what has been called the "no man's land" area.

NLRB has 11 standards by which it judges what disputes should come within its jurisdiction. Most of them are based on the annual dollar volume of business of the employer.

Duel with Dozers

A couple of Canadian construction men fought a duel with bulldozers, but the rules of chivalry did not apply. One of them manned a 40-ton machine; the other rode a 15-ton steed.

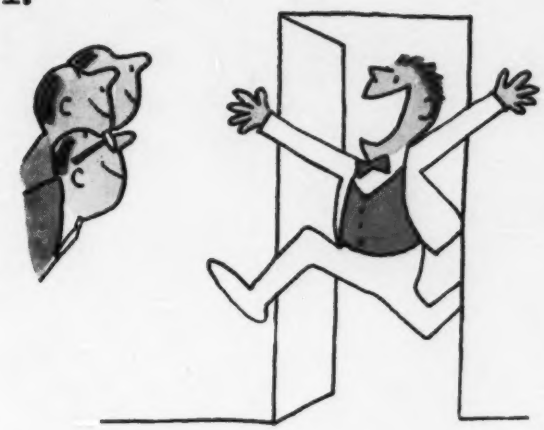
The duel arose from a dispute over ownership of a pile of sand. John Susin of the Susin Construction Co. said it was needed to backfill a storm sewer. Raymond Clement of the Campeau Construction Co. said it was there to be used for road fill.

When the argument grew hot, Susin slammed his 40-ton dozer into the side of Clement's 15-ton rig. Clement backed off, and tried to outmaneuver the heavier machine. But the heavier weight of Susin's mount carried the day. Clement was forced to jump off and watch his steed rolled ignominiously into a ditch.

The decision finally was handed down in court where Ottawa Magistrate Joachim Sauve said: "This is the strangest case I have dealt with in my 19 years on the bench." He fined Susin $50.

Al protects *his* road with an umbrella

1.



"All mine!" Al Arch exploded as he tumbled through his door,
"That superhighway contract from the city to the shore!"
His men assembled round him and each took him by the hand,
Our hero felt, as you'd expect, just simply, wholly GRAND!

2.

His Travelers man stopped in to find him gazing pensively.
Said Al, "Your bond was super-fast and right as it could be,
But we push off to start at dawn, we need a covering plan!"
"We quickly handle every need," replied his Travelers man.

3.

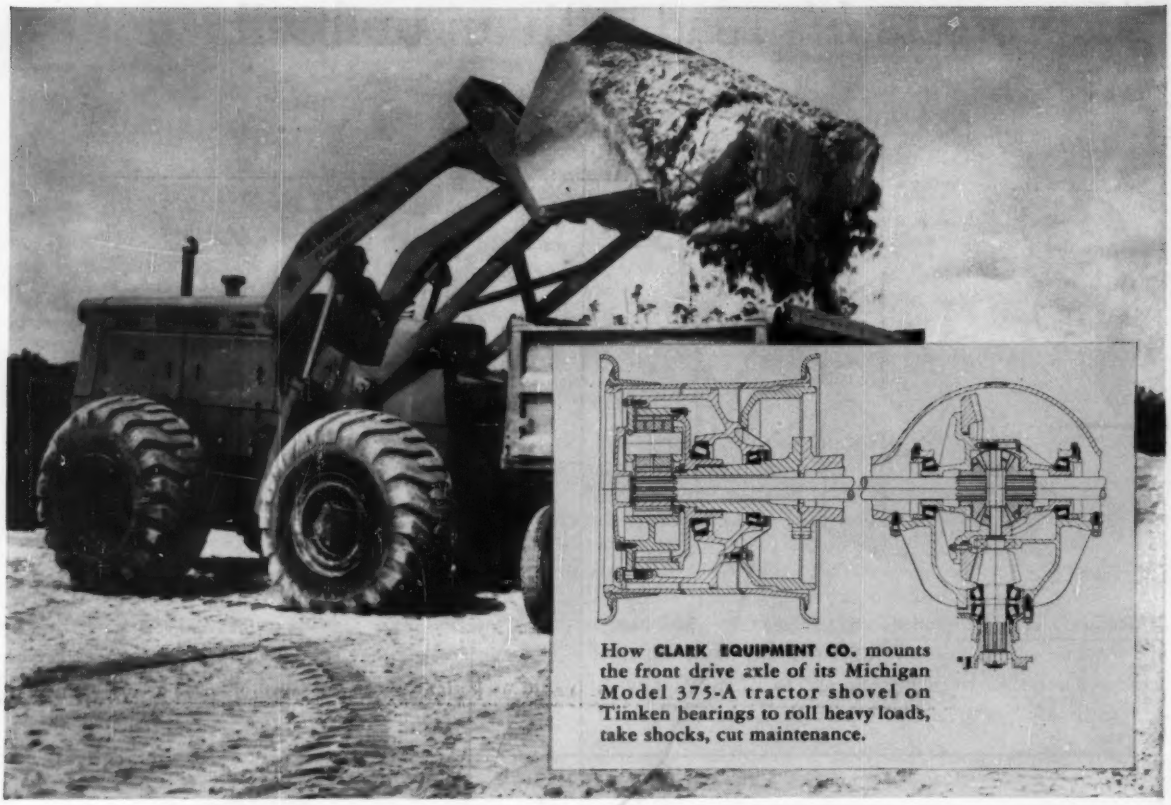
"You have our Workman's Comp and Public Liability,
So if a man gets hurt, he's *our* responsibility.
And our Equipment Floater is good fortune's best defense:
Collision, upset, fire, theft—not yours, but *our* expense.

4.

"And finally, our Builder's Risk Insurance can't be beat,
Protects like an umbrella till your venture is *complete!*"
If *you've* a highway in the works, be sure to check this plan,
Just make a call, he's on the ball, your able Travelers man.

THE TRAVELERS
Insurance Companies
HARTFORD 15, CONNECTICUT

All forms of business and personal insurance including Life • Accident • Group • Fire • Marine • Automobile • Casualty • Bonds



How **CLARK EQUIPMENT CO.** mounts the front drive axle of its Michigan Model 375-A tractor shovel on Timken bearings to roll heavy loads, take shocks, cut maintenance.

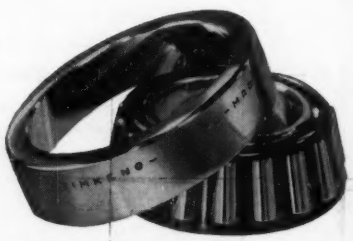
Kills the job . . . spares the man with 54 Timken® bearings to roll it easy

IT can lift a 6-yard load at one pass, fill a 14-yard haul-truck in two minutes! It's huge—weighs 56,000 lbs. Yet it can travel at 30 mph. That's the Michigan Model 375-A tractor shovel. And to help make the operator's work easy, it has hydraulic controls, power steering, power shift—and 54 Timken® tapered roller bearings to take the shocks, roll the loads. They're used in the front drive axle, rear drive steer axle, the torque converter and power shift transmission.

Timken bearings take heavy shocks and take 'em longer. That's because their rollers and races are case-carburized to produce hard, wear-resistant surfaces and tough, shock-resistant cores. And full line contact between rollers and races gives Timken bearings extra load-carrying capacity. The Model 375-A makes big jobs easy, like loading out up to 3,000 tons of limestone a day, because Timken bearings *roll* all the loads.

Because of their tapered design, Timken bearings take radial and thrust loads in all combinations. They practically eliminate friction because they're geometrically designed and precision-made to roll true.

Timken bearings make any machine better. And better machines do better work. That's Better-ness. Its symbol is the trade-mark "TIMKEN". Look for it. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*



BETTER-NESS rolls on

TIMKEN®

tapered roller bearings

First in bearings for 60 years